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ROTATIONAL STRUCTURE AND ABSORPTION CROSS SECTIONS FROM 300 K TO 190 K OF THE SCHUMANN-RUNGE BANDS

by

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FOREWORD

The present AERONOMICA ACTA consists of tables and figures assembled for use in modelling the transmission of the ultraviolet solar flux in the spectral region of the photodissociation of molecular oxygen in the mesosphere and stratosphere. Support for the preparation of this Aeronomica Acta has been provided by the **Chemical Manufacturers Association,** Contract FC 85-563 with the **Institut d'Aéronomie Spatiale,** by the **Commission of the European Communities,** Directorate-General for Science, Research and Development, Environment Research Programme and by the **Office of Naval Research contract with the Communications and Space Sciences Laboratory of the Pennsylvania State University.**

VOORWOORD

Deze AERONOMICA ACTA bestaat uit een aantal tabellen en figuren die als basis moeten dienen om, in de stratosfeer en de mesosfeer, de transmissie van de zonnestraling te bepalen in de ultraviolette gebieden van het spectrum die overeenstemmen met de fotodissociatie van zuurstofmoleculen. Steun voor de voorbereiding van deze atlas werd bekomen bij de **"Chemical Manufacturers Association"**, Contract FC 85-563 met het **Belgisch Instituut voor Ruimte-Aëronomie,** de **Commissie van de Europese Gemeenschappen,** het "Directoraat Generaal voor Wetenschap Onderzoek en Ontwikkeling", het programma voor milieustudie en het **Office of Naval Research contract with the Communications and Space Sciences Laboratory of the Pennsylvania State University.**

AVANT-PROPOS

Cet AERONOMICA ACTA est constitué d'un ensemble de tableaux et de figures devant servir de base à une détermination, dans la stratosphère et la mésosphère, de la transmittance de la radiation solaire dans les régions ultraviolettes du spectre correspondant à la photodissociation de l'oxygène moléculaire. La préparation de cet atlas a bénéficié du support de **Chemical Manufacturers Association,** Contract FC 85-563 avec l'**Institut d'Aéronomie Spatiale,** de la **Commission des Communautés Européennes,** Direction générale de la Science, de la Recherche et du Développement, Programme de Recherche Environnement et de l'**Office of Naval Research contract with the Communications and Space Sciences Laboratory of the Pennsylvania State University.**

VORWORT

Die vorliegende AERONOMICA ACTA, enthält Tabellen und Abbildungen, die als Basis dienen um in der Stratosphäre und der Mesosphäre die Transmission der ultravioletten Sonnenstrahlung zu bestimmen im Spektralbereich der Photodissoziation von O_2. Unterstützung für die Vorbereitung dieses Atlas kam von der **Chemical Manufacturers Association,** Vertrag FC 85-563 mit dem **Institut d'Aéronomie Spatiale, der Kommission der Europaïsche Gemeinschaften,** "Generaldirection Wissenschaft, Forschung und Entwicklung, Forschungsprogramme Umwelt, und dem **Office of Naval Research contract, with the Communications and Space Sciences Laboratory of the Pennsylvania State University.**

SAMENVATTING

De werkzame absorptiedoorsneden van zuurstofmoleculen, berekend voor temperaturen tussen 300 K and 190 K, worden voorgesteld onder de vorm van tabellen en figuren in functie van het golfgetal in het spectraal gebied gaande van 49000 cm^{-1} tot 57000 cm^{-1}. Het overeenstemmende spectrum van het Schumann-Runge systeem B $^3\Sigma_u^-$ - X $^3\Sigma_g^-$ van O_2 wordt voorgesteld in 32 intervallen van 250 cm^{-1} voor het geheel van rotatielijnen die het gebied van de banden (0 - 0) tot (19 - 0) beslaan. De berekende werkzame absorptiedoorsneden werden voor iedere band bepaald, na vergelijking met de meest recente experimentele resultaten bekomen bij 300 K. Aldus heeft dit soort berekening, na introductie van de continu absorptie, de voorafgaande bepaling van het golfgetal vereist van alle lijnen van de banden (0 - 0) tot (19 - 0) en van (2 - 1) tot (19 - 1), met de gemiddelde waarden van hun oscillatorkrachten en het aannemen van een equivalente breedte van de rotatielijnen voor iedere band.

ZUSAMMENFASSUNG

Die O_2 wirksamen Absorptionsquerschnitte, berechnet für Temperaturen zwischen 300 K und 190 K, werden wiedergegeben in Tabellen und Abbildungen als Funktion der Wellenzahl im Spektralgebiet von 49000 cm^{-1} bis 57000 cm^{-1}. Das entsprechende Spektrum des Schumann-Runge Bandensystems B $^3\Sigma_u^-$ - X $^3\Sigma_g^-$ von O_2 wird dargestellt in 32 Intervallen von 250 cm^{-1} für den gesamten Bereich der Rotationlinien im Gebiet der Banden (0 - 0) bis (19 - 0). Die berechneten wirksamen Absorptionsquerschnitte werden für jedes Band bestimmt, und mit den neuesten experimentellen Resultaten bei 300 K verglichen. Diese Berechnungen, unter Berücksichtigung der kontinuierlichen Absorption erforderten, die vorhergehende Bestimmung der Wellenzahl von allen Linien der Banden (0 - 0) bis (19 - 0) und von (2 - 1) bis (19 - 1), mit den mittleren Werten ihrer Oszillatorstärke und die Annahme einer equivalenten Bandbreite der Rotationlinien.

ABSTRACT

Tables and figures of calculated absorption cross sections are given for molecular oxygen as a function of wavenumber over the spectral interval 49000 - 57000 cm^{-1} for temperatures between 190 and 300 K. The spectrum corresponding to the domain of the rotation lines of the various bands of the B $^3\Sigma_u^-$ - X $^3\Sigma_g^-$ Schumann-Runge system with their underlying continua is presented for the range of the (0-0) to (19-0) bands in 32 intervals of 250 cm^{-1}. Calculated absorption cross sections have been determined for each band after a comparison with the most recent laboratory measurements made at 300 K. The calculations required knowledge of the line wavenumbers of the (0-0) to (19-0) and (2-1) to (19-1) bands with their mean oscillator strengths and determination of the associated equivalent linewidths of the rotation lines with their underlying continuum.

RESUME

Les sections efficaces d'absorption de l'oxygène moléculaire, calculées pour des températures comprises entre 300 K and 190 K, sont présentées sous forme de tableaux et de figures en fonction du nombre d'onde dans la région spectrale s'étendant de 49000 cm^{-1} à 57000 cm^{-1}. Le spectre correspondant du système B $^3\Sigma_u^-$ - X $^3\Sigma_g^-$ de Schumann-Runge de O_2 est représenté dans 32 intervalles de 250 cm^{-1} pour l'ensemble des raies de rotation couvrant le domaine des bandes (0 - 0) à (19 - 0). Les sections efficaces d'absorption calculées ont été déterminées pour chaque bande après comparaison avec les résultats expérimentaux les plus récents obtenus à 300 K. Ainsi ce type de calcul, après l'introduction de l'absorption continue, a requis la détermination préalable du nombre d'onde de toutes les raies des bandes (0 - 0) à (19 - 0) et de (2 - 1) à (19 - 1) avec les valeurs moyennes de leurs forces d'oscillateur et l'adoption d'une largeur équivalente des raies de rotation pour chaque bande.

INTRODUCTION

The present tables and figures intend to serve those who require information about the ultraviolet absorption of molecular oxygen in the region of the predissociation of the O_2 Schumann-Runge system. In this inventory the recent experimental data on the rotation lines and underlying continua were used after an analysis of the extensive literature on oxygen absorption coefficients (see, for references, Nicolet and Kennes, 1987, and to be published; Nicolet, Cieslik and Kennes, 1987 to be published).

After the first detailed analyses such as the wavelength assignments, for $v' \geq 12$, of Brix and Herzberg (1954) and, for $v' \leq 13$, of Ackerman and Biaumé (1970) and Biaumé (1972), extensive wavenumber measurements of the rotation lines of the O_2 Schumann-Runge absorption bands were provided by Yoshino, Freeman and Parkinson (1984). These sets of data are also the most accurate and almost complete since the cross sections are absolute, the linewidths being in excess of the instrument resolution for the various bands studied.

Recent rotational constants of the upper electronic state of the Schumann-Runge system have been also published recently by Cheung, Yoshino, Parkinson and Freeman (1986). These constants give the possibility of calculating the wavenumbers of the rotation lines which are given in the various tables of this atlas. The same spectroscopic constants have been also determined by Lewis, Berzins and Calver (1986) from the wavenumber measurements of Yoshino et al. (1984).

The band oscillator strengths of the (v', o) and (v', 1) bands adopted here are based on the various results of Yoshino, Freeman, Esmond and Parkinson (1983), of Cheung, Yoshino, Parkinson and Freeman (1984), of Yoshino, Freeman, Esmond and Parkinson (1987), of Lewis, Bergins and Carver (1986), and also of Allison, Dalgarno and Pasachoff (1971).

The predissociation linewidths have been determined after a detailed comparison between calculated absorption cross sections and the experimental results published by Yoshino et al. (1983) in the spectral region corresponding to the $v' = 1$ to 12 bands. However, the absorption cross sections throughout this region may depend also on the underlying continuum corresponding near 50000 cm^{-1} to the O_2 Herzberg continuum (see Nicolet and Kennes, 1986, and 1987 to be published). At wavenumbers greater than 55000 cm^{-1}, the O_2 Schumann-Runge continuum (see Lewis, Bergins and Carver, 1985a,b) plays a role related to the temperature.

THE ROTATIONAL STRUCTURE OF THE BANDS

The Schumann-Runge bands of O_2 arise from the transition $B\ ^3\Sigma_u^- - X\ ^3\Sigma_g^-$ in the 49000 - 57000 cm^{-1} spectral region containing in absorption the rotation lines from bands with $v' = 0$ to 19 and $v'' = 0$ and 1 when the temperature is not more than 300 K. The spectral intervals adopted for the calculation of the absorption cross sections are given in Table 1. This table shows that, from 2-0 to 19-0, the intervals decrease from 665 cm^{-1} to 75 cm^{-1} corresponding to a variation of 2.62 nm to 0.23 nm. The absorption occurs mostly in the

TABLE 1.- Adopted spectral intervals for the Schumann-Runge bands of O_2

Band	Wavenumber (cm)	Mean	Δν	Wavelength (mm)	Mean	Δλ
0-0	49000-49500	49250	500	204.08-202.02	203.04	2.06
1-0	49500-50050	49777	550	202.02-199.80	200.90	2.22
2-0	50050-50715	50382	665	199.80-197.18	198.48	2.62
3-0	50715-51355	51035	640	197.18-194.72	195.94	2.46
4-0	51355-51975	51665	620	194.72-192.40	193.55	2.32
5-0	51975-52565	52270	590	192.40-190.24	191.31	2.16
6-0	52565-53130	52847	565	190.24-188.22	189.22	2.02
7-0	53130-53660	53395	530	188.22-186.36	187.28	1.86
8-0	53660-54160	53910	500	186.36-184.64	185.49	1.72
9-0	54160-54625	54392	465	184.64-183.07	183.85	1.57
10-0	54625-55055	54840	430	183.07-181.64	182.35	1.43
11-0	55055-55440	55247	385	181.64-180.37	181.00	1.27
12-0	55440-55790	55615	350	180.37-179.14	179.80	1.13
13-0	55790-56090	55940	300	179.24-178.28	178.76	0.96
14-0	56090-56345	56217	255	178.28-177.48	177.88	0.80
15-0	56345-56550	56447	205	177.48-176.83	177.16	0.65
16-0	56550-56725	56637	175	176.83-176.29	176.56	0.57
17-0	56725-56855	56790	130	176.29-175.89	176.09	0.40
18-0	56855-56960	56907	105	175.89-175.56	175.72	0.33
19-0	56960-57035	56997	75	175.56-175.33	175.45	0.23

six principal branches, P and R. The final results of the calculations, as shown in Figures a_1, b_1, c_1 and d_1 for 300 K, illustrate that the distribution of the intensity varies greatly in each 500 cm^{-1} interval. At low temperature, 190 K, as illustrated in Figures a_2, b_2, c_2 and d_2, the structure is different since the rotation lines of the bands with v" = 1 do not play any role. The rotational structure represents at low temperature only the bands from v" = 0. Such variations may be compared with the averaged cross sections from 500 cm^{-1} intervals at various temperatures 300, 270, 250, 230, 210 and 190 K shown in Figures a_3, b_3, c_3 and d_3. The maximum averaged cross sections for 500 cm^{-1} intervals vary from about 8×10^{-24} cm^2 between 49000 - 49500 cm^{-1} (practically the underlying continuum) to almost 2×10^{-19} cm^2 between 56500 - 57000 cm^{-1} corresponding to the spectral range of the 15-0 to 19-0 bands. A variation of 10^4 in the absorption cross sections (10^{-23} to 10^{-19} cm^2) indicates that atmospheric absorption must be considered from the mesopause to the lower stratosphere for temperatures between 270 K and less than 190 K.

THE LINE POSITIONS AND ROTATIONAL ASSIGNMENTS

The measured line positions and rotational assignments made by Brix and Herzberg (1954) and by Ackerman and Biaumé (1970) are essentially identical to the recent results obtained by Yoshino, Freeman and Parkinson (1984). The measurements of this last study were performed at high resolution and include the detailed rotational line assignments at 300 K. The molecular spectroscopic constants deduced from these measurements by Cheung et al. (1986) have been adopted and are given in Table 2. They may be compared with the constants used by Lewis, Bergins and Carver (1986) and obtained also from the wavenumber measurements of Yoshino et al. (1984).

The spectroscopic constants of Table 2 have been used to determine the computed line positions with their respective rotational assignments. The calculated wavenumbers, with their corresponding wavelengths, of the rotation lines of the 6 principal branches $R_{1,2,3}$ and $P_{1,2,3}$ are given in Tables I to XXXII corresponding to 250 cm^{-1} intervals. No calculation was made for lines of rotational levels N > 30 and of vibrational levels v' > 19.

TABLE 2.- Adopted spectroscopic constants for the upper state of the Schumann-Runge bands of O_2 to compute line positions.

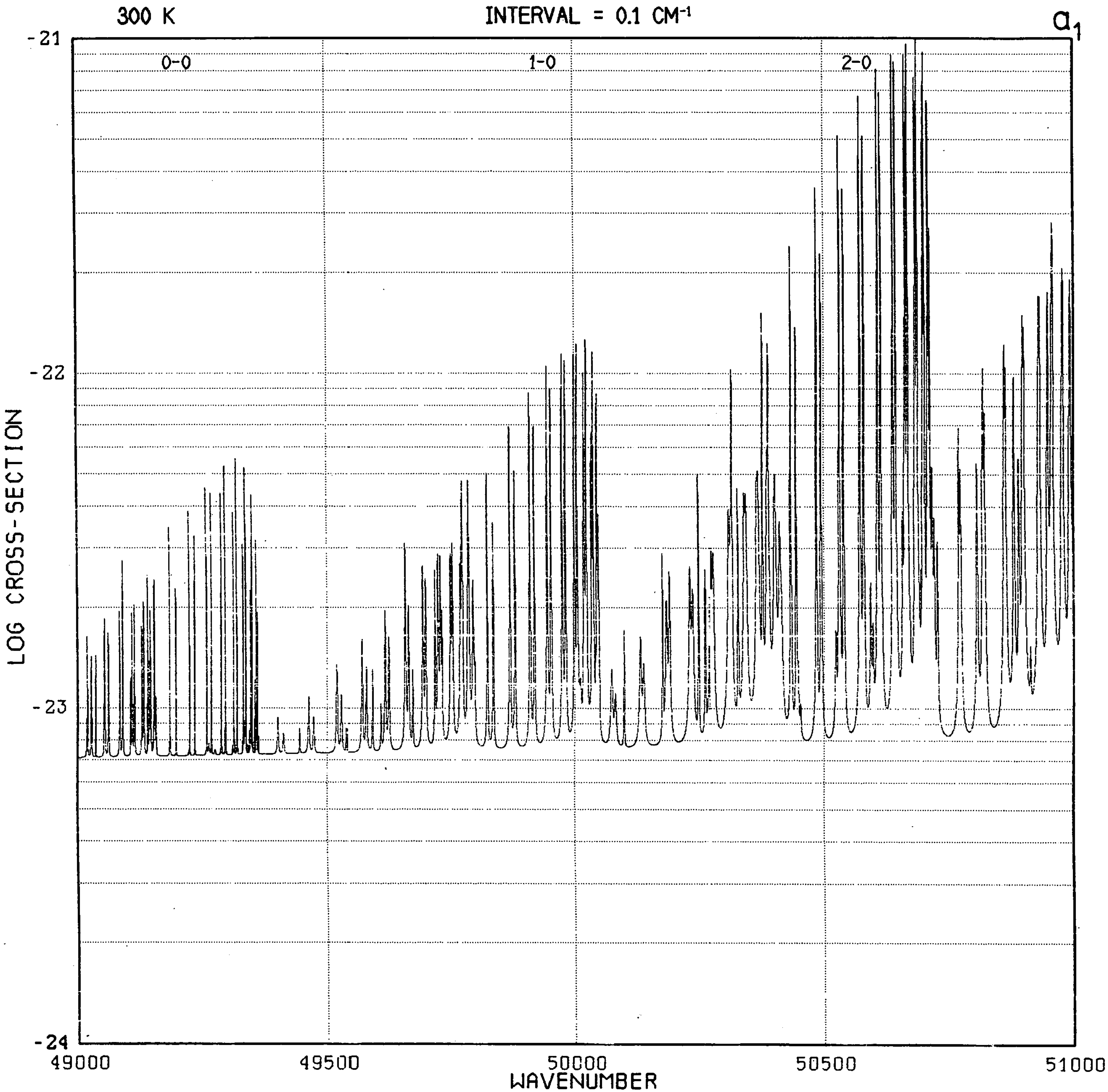
Band	ν_o (cm^{-1})	B_v	D_v	λ_v	γ_v
0-0	49357.96	0.8132	4.50×10^{-6}	1.69	-2.80×10^{-2}
1-0	50045.53	0.7993	4.20	1.70	- 2.60
2-0	50710.68	0.7860	5.80	1.69	- 2.90
3-0	51351.94	0.7705	5.20	1.70	- 2.60
4-0	51969.36	0.7550	5.97	1.81	- 3.00
5-0	52560.94	0.7377	5.80	1.75	- 2.20
6-0	53122.65	0.7187	5.00	1.79	- 2.10
7-0	53655.95	0.7010	8.60	1.82	- 2.10
8-0	54156.22	0.6770	6.70	1.91	- 2.30
9-0	54622.50	0.6514	6.30	2.04	- 2.10
10-0	55051.16	0.6263	9.90	2.10	- 4.10
11-0	55439.23	0.5956	9.40	2.17	- 3.80
12-0	55784.58	0.5626	1.37×10^{-5}	2.37	- 5.40
13-0	56085.44	0.5242	1.63	2.51	- 8.40
14-0	56340.42	0.4832	2.09	2.81	-1.16×10^{-1}
15-0	56550.62	0.4391	2.54	3.30	- 1.64
16-0	56719.62	0.3934	3.08	4.11	- 2.41
17-0	56852.45	0.3457	3.34	5.18	- 3.48
18-0	56951.60	0.2872	5.50	6.51	- 4.94
19-0	57025.80	0.2649	6.00	7.63	- 6.04

ν_o = band origin = $T + \frac{2}{3}\lambda - \gamma$ as given by Cheung and al. (1966)

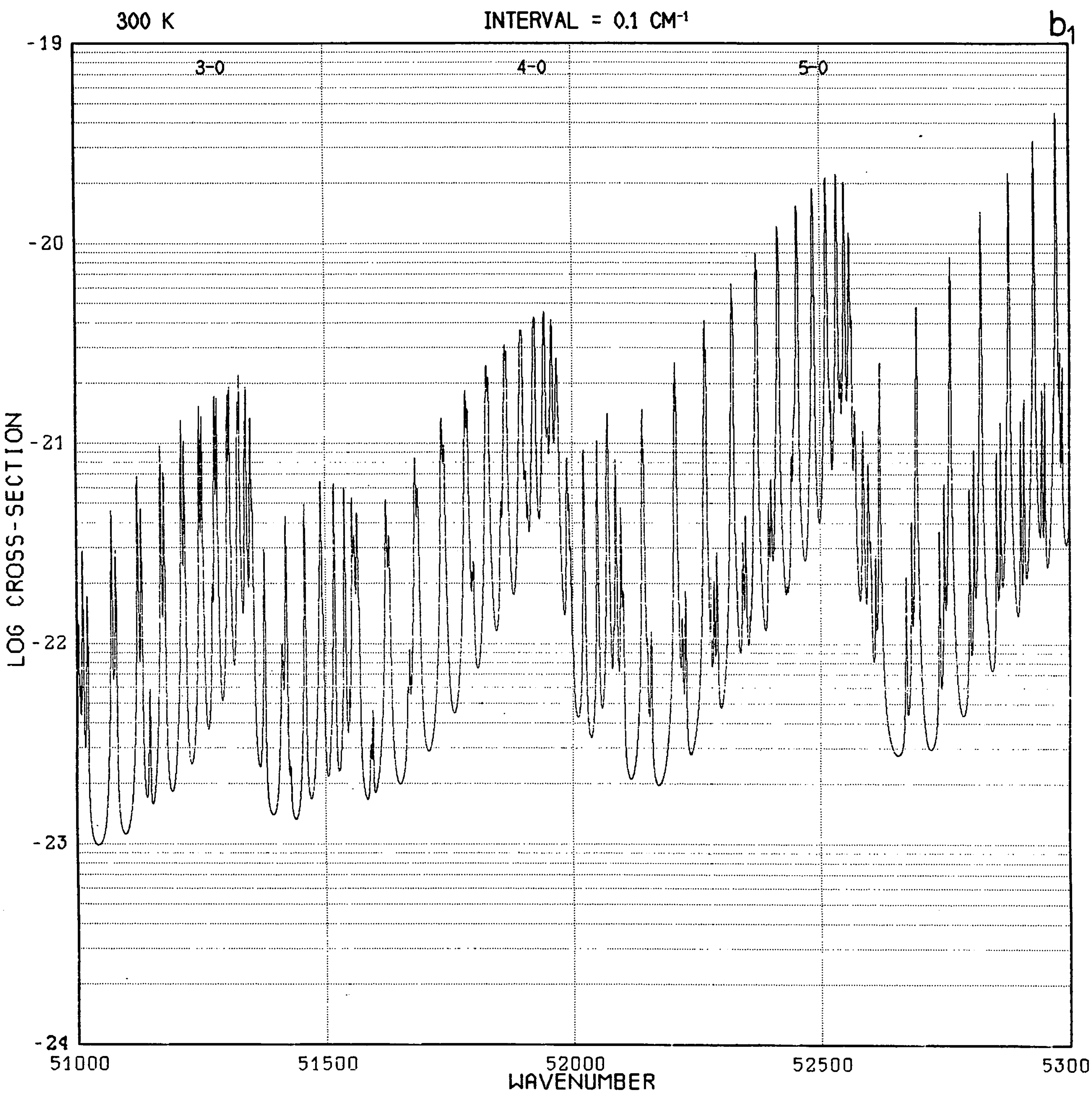
B_v and D_v = rotational constants for vibrational levels

λ_v and γ_v splitting constants for vibrational levels.

For 18-0 and 19-0, see Fang, Wofsy and Dalgarno (1974).



300 K
INTERVAL = 0.1 CM⁻¹
a1
0-0
1-0
2-0
-21
-22
-23
-24
LOG CROSS-SECTION
49000
49500
50000
50500
51000
WAVENUMBER


300 K
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4-0
5-0
LOG CROSS-SECTION
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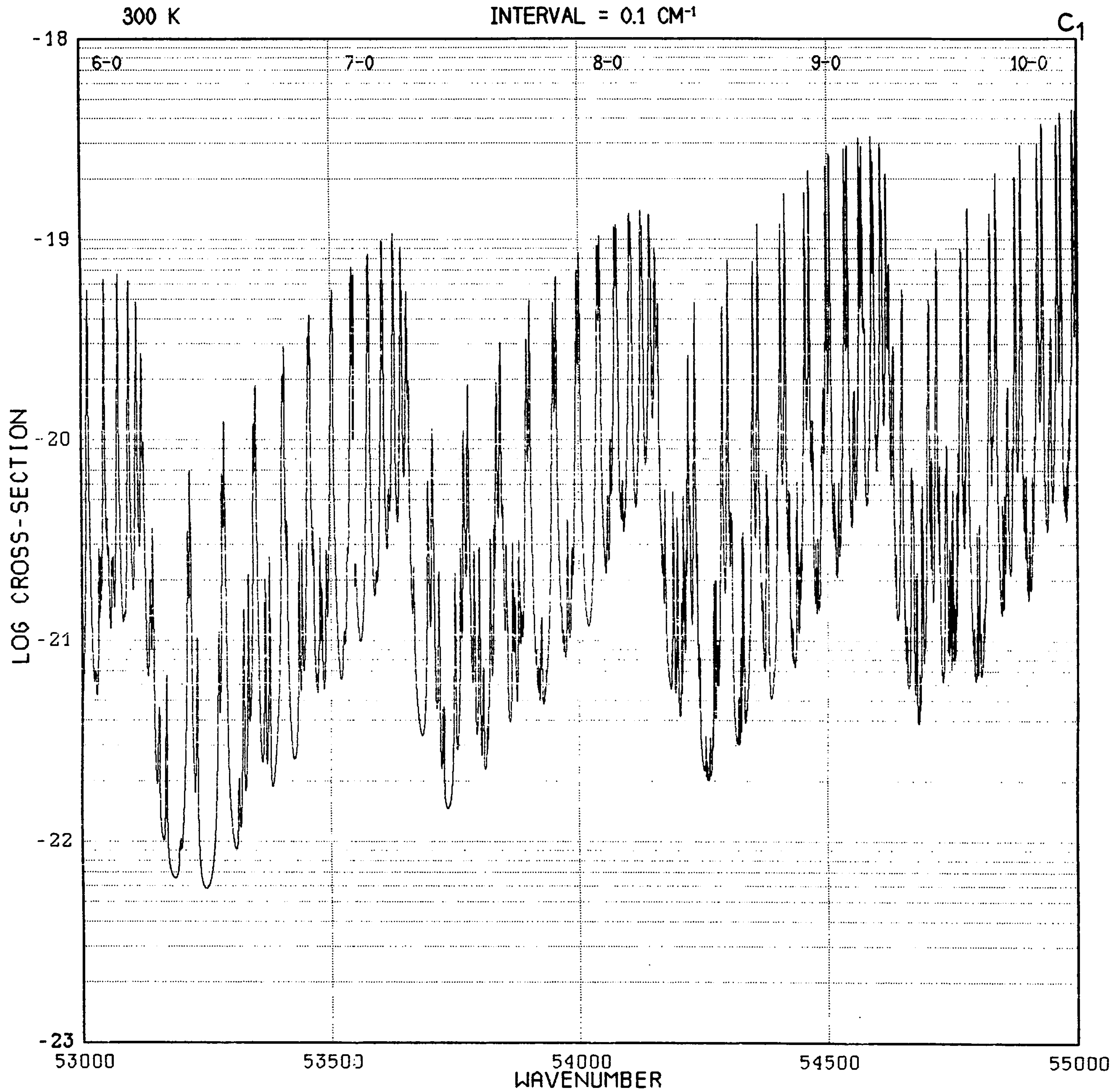
-23
-24
51000
51500
52000
52500
53000
WAVENUMBER



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C1
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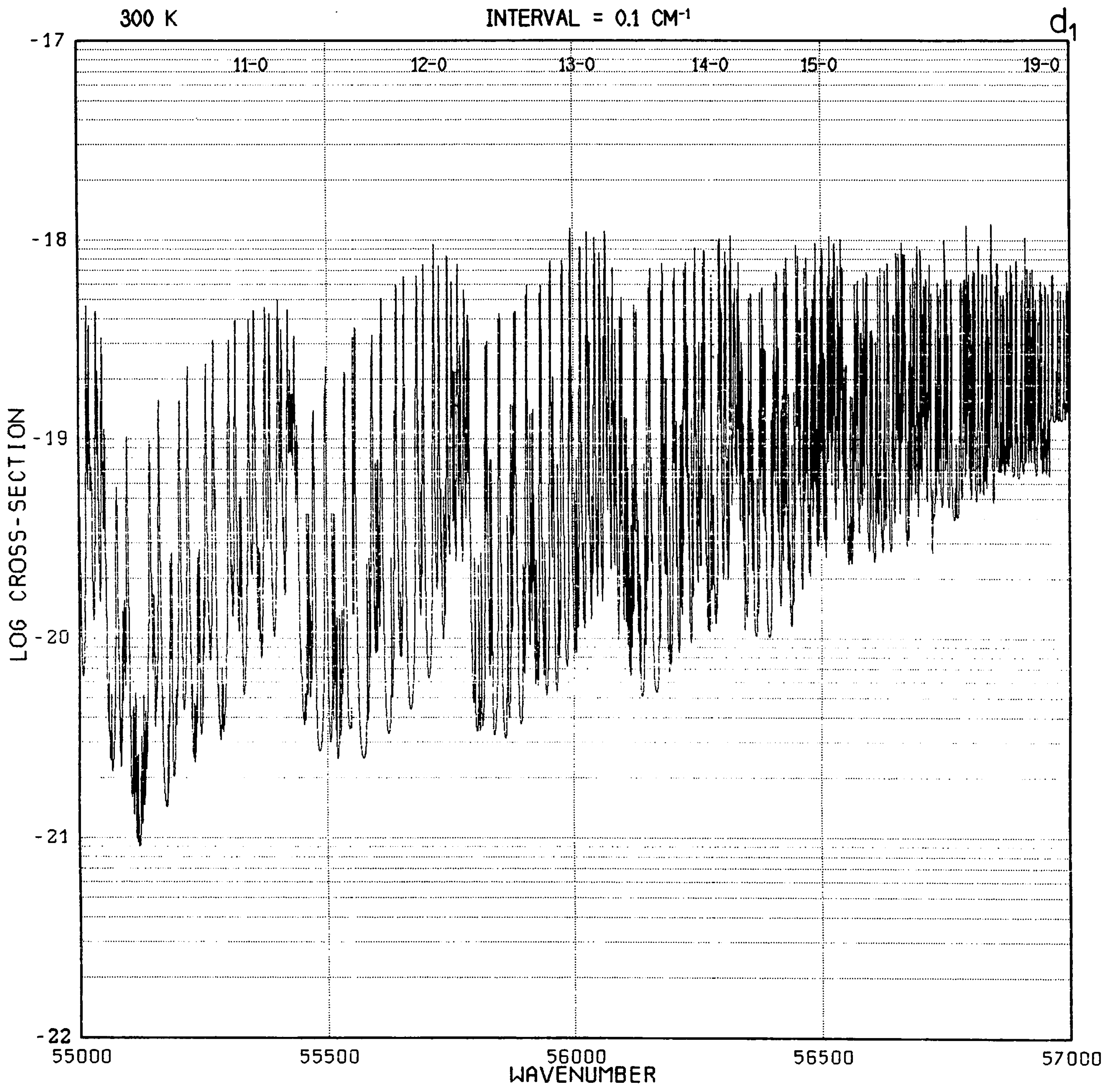
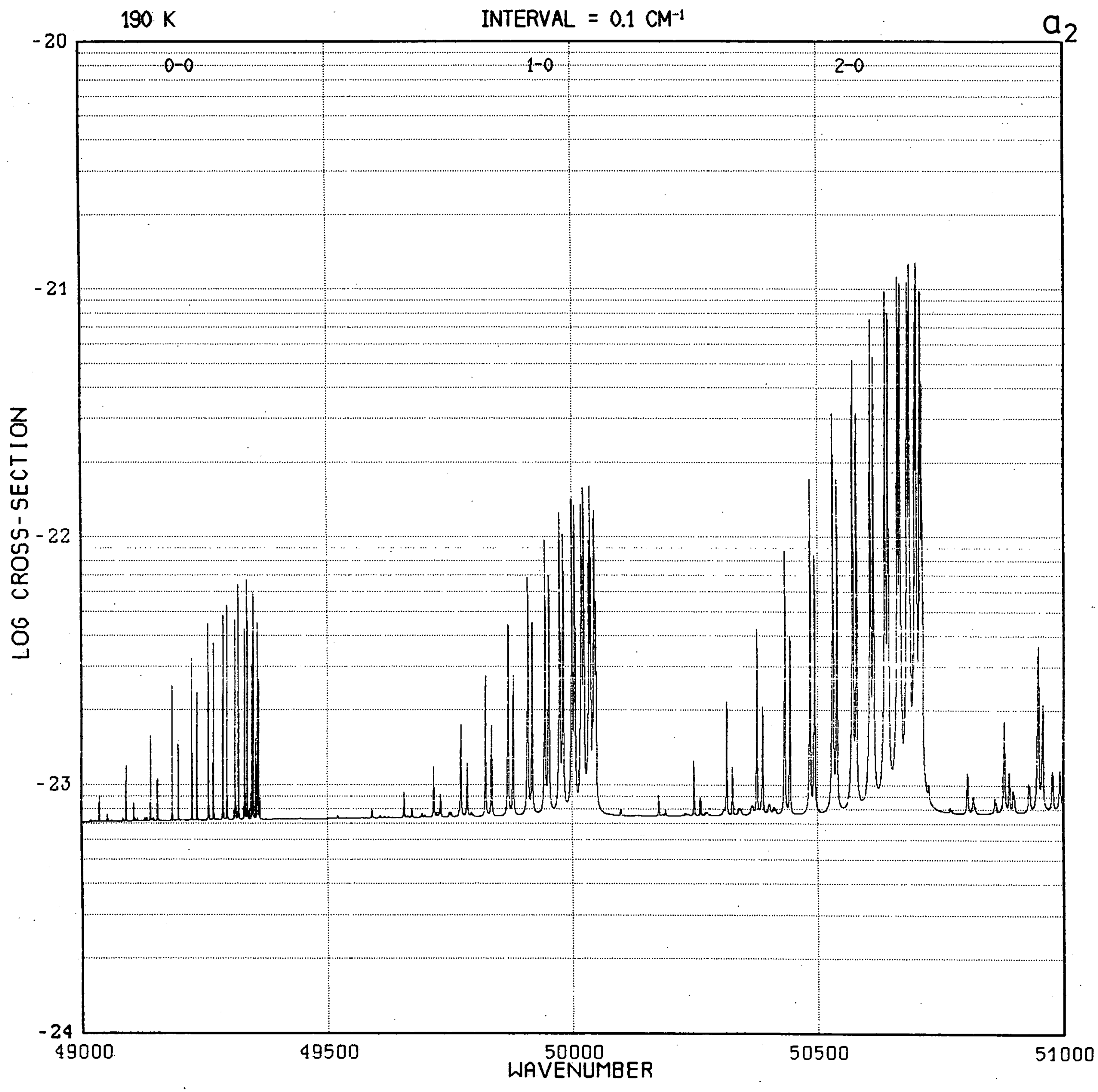
7-0
8-0
9-0
10-0
-18
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53000
53500
54000
54500
55000
WAVENUMBER



300 K
INTERVAL = 0.1 CM⁻¹
d1
11-0
12-0
13-0
14-0
15-0
19-0
-17
-18
-19
-20
-21
-22
LOG CROSS-SECTION
55000
55500
56000
56500
57000
WAVENUMBER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LOG CROSS-SECTION
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-24
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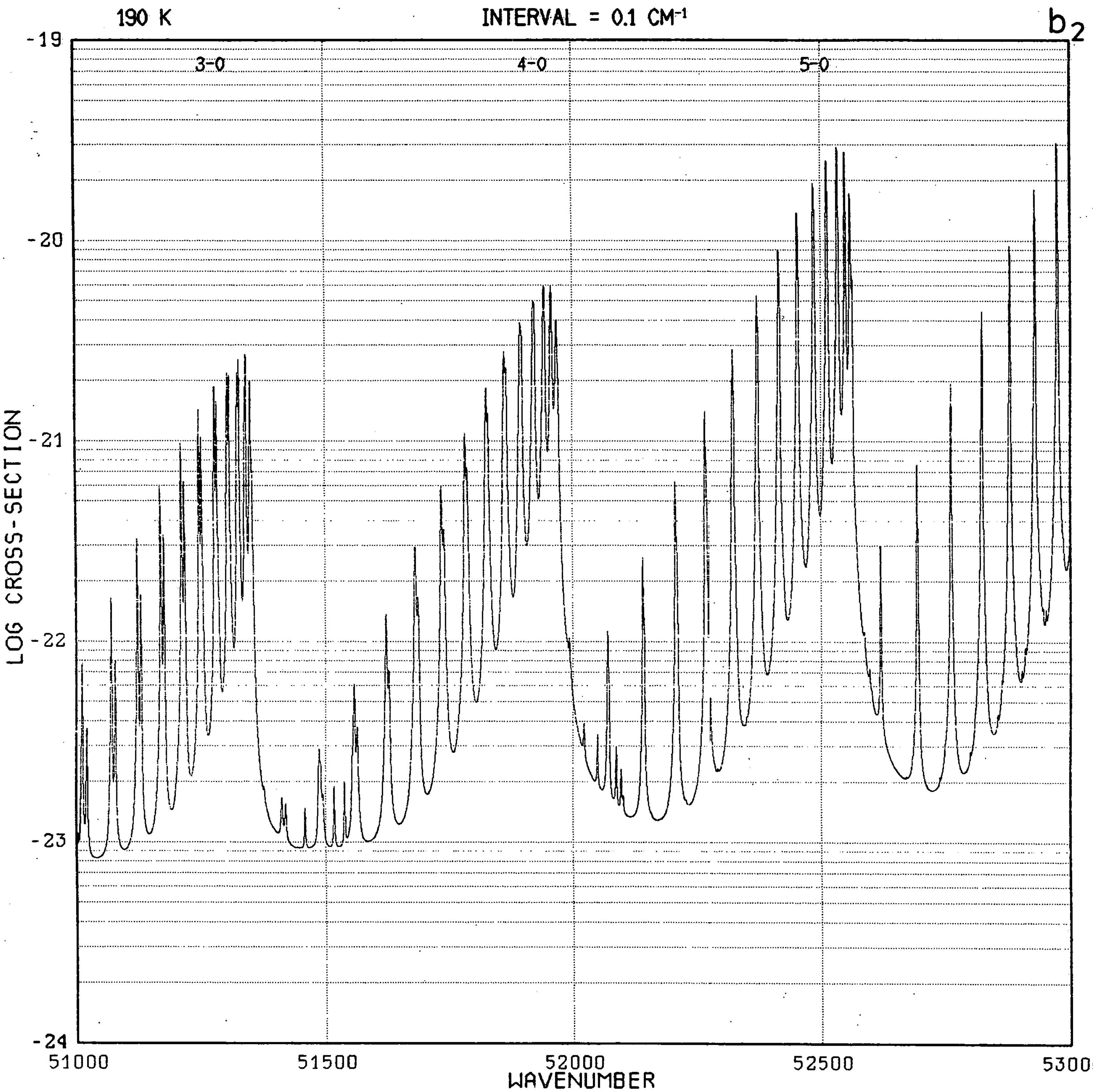
49500
50000
50500
51000
WAVENUMBER



190 K
INTERVAL = 0.1 CM-1
b2
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4-0
5-0
LOG CROSS-SECTION
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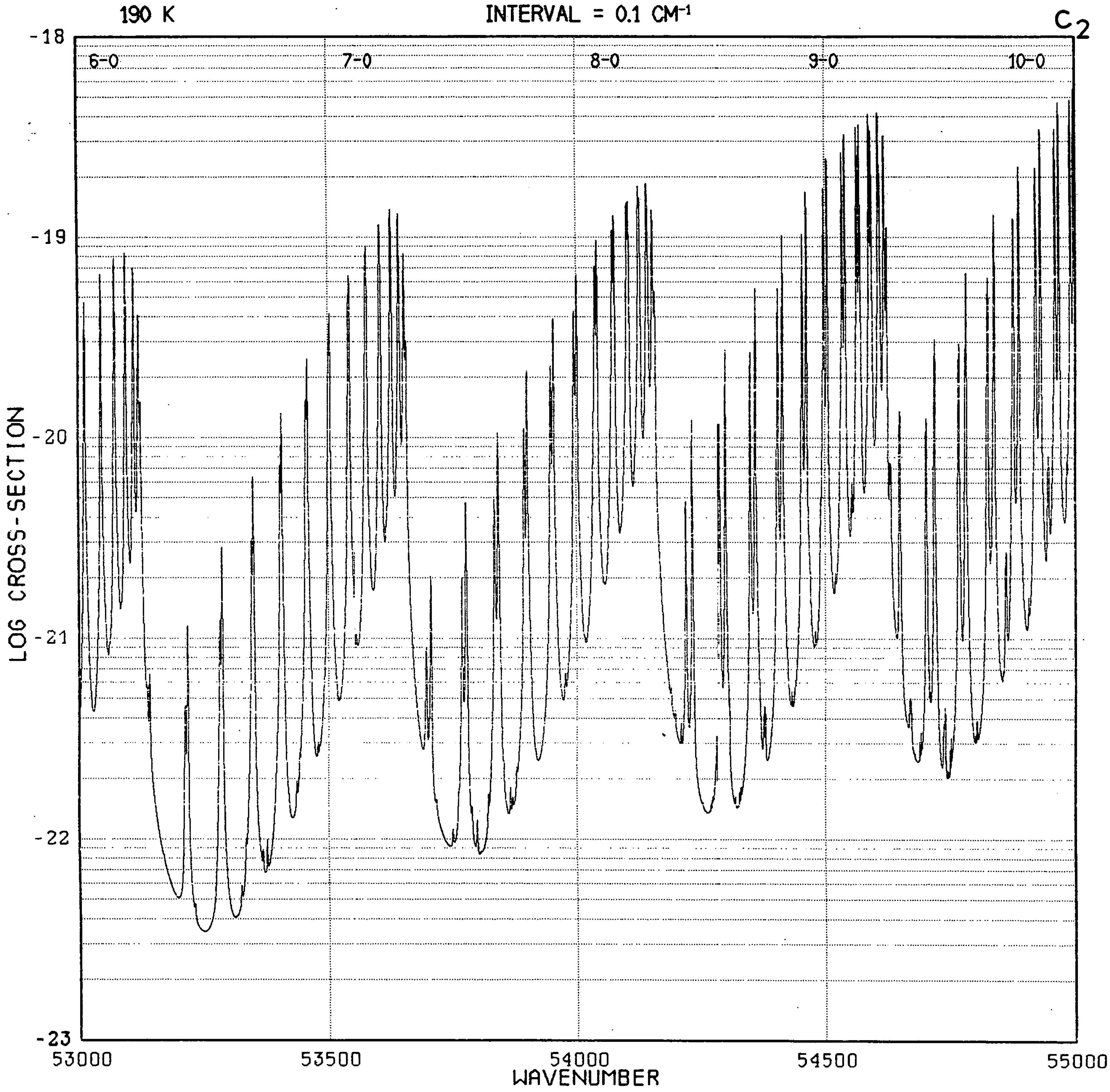
WAVENUMBER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C_2
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10-0
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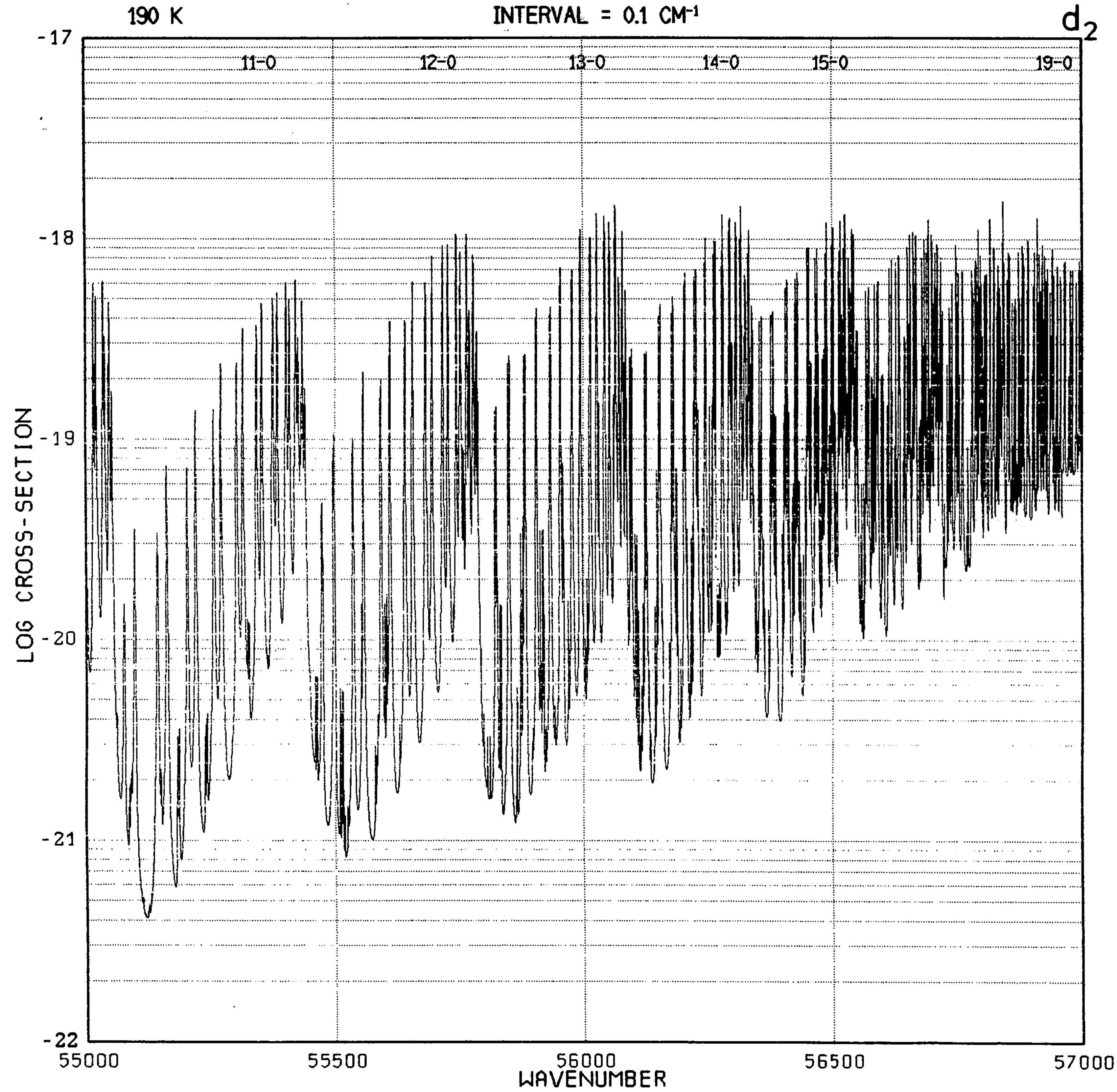
190 K
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LOG CROSS-SECTION
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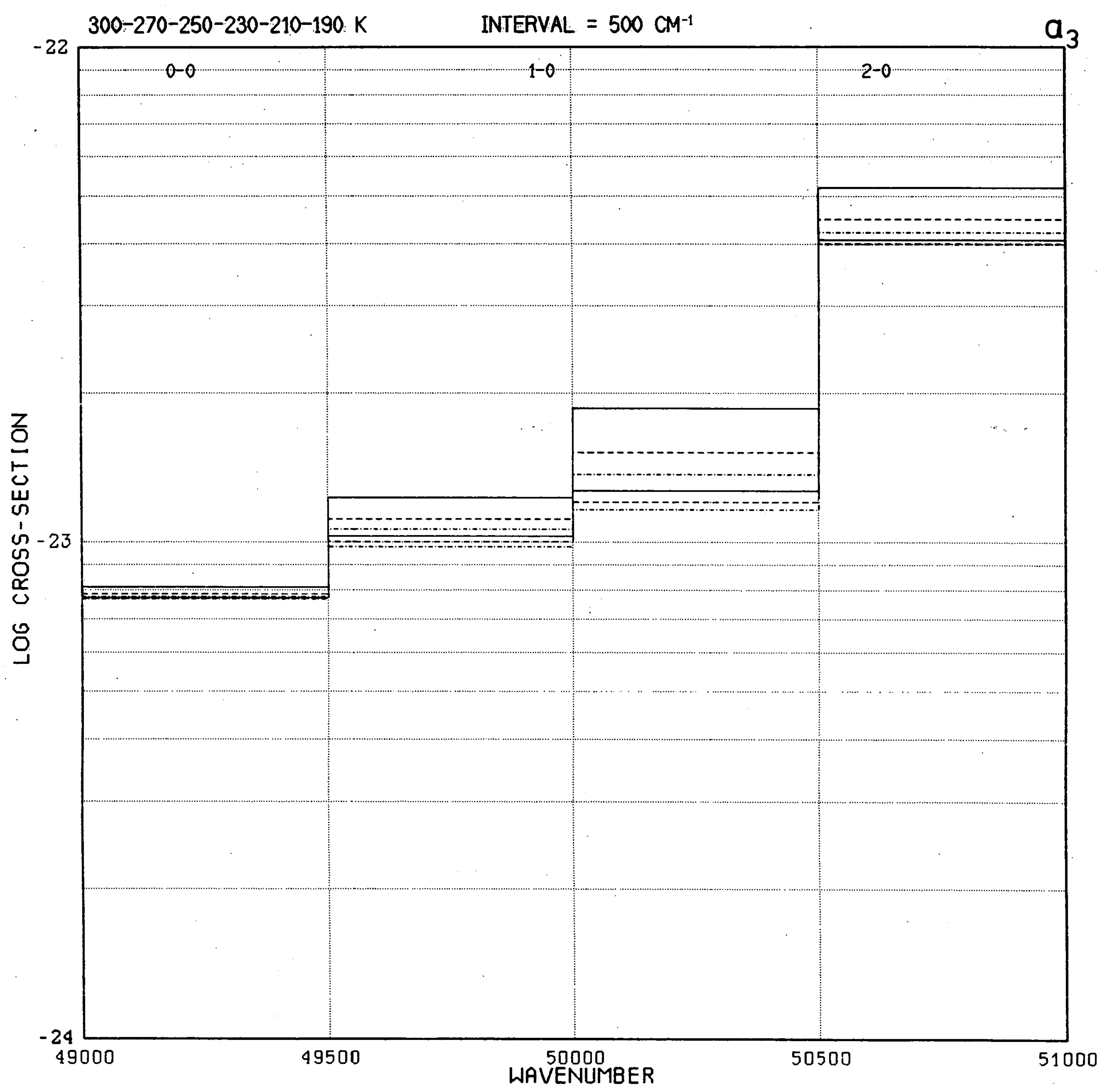
WAVENUMBER



300-270-250-230-210-190 K
INTERVAL = 500 CM-1
a3
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-23
-24
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1-0
2-0
LOG CROSS-SECTION
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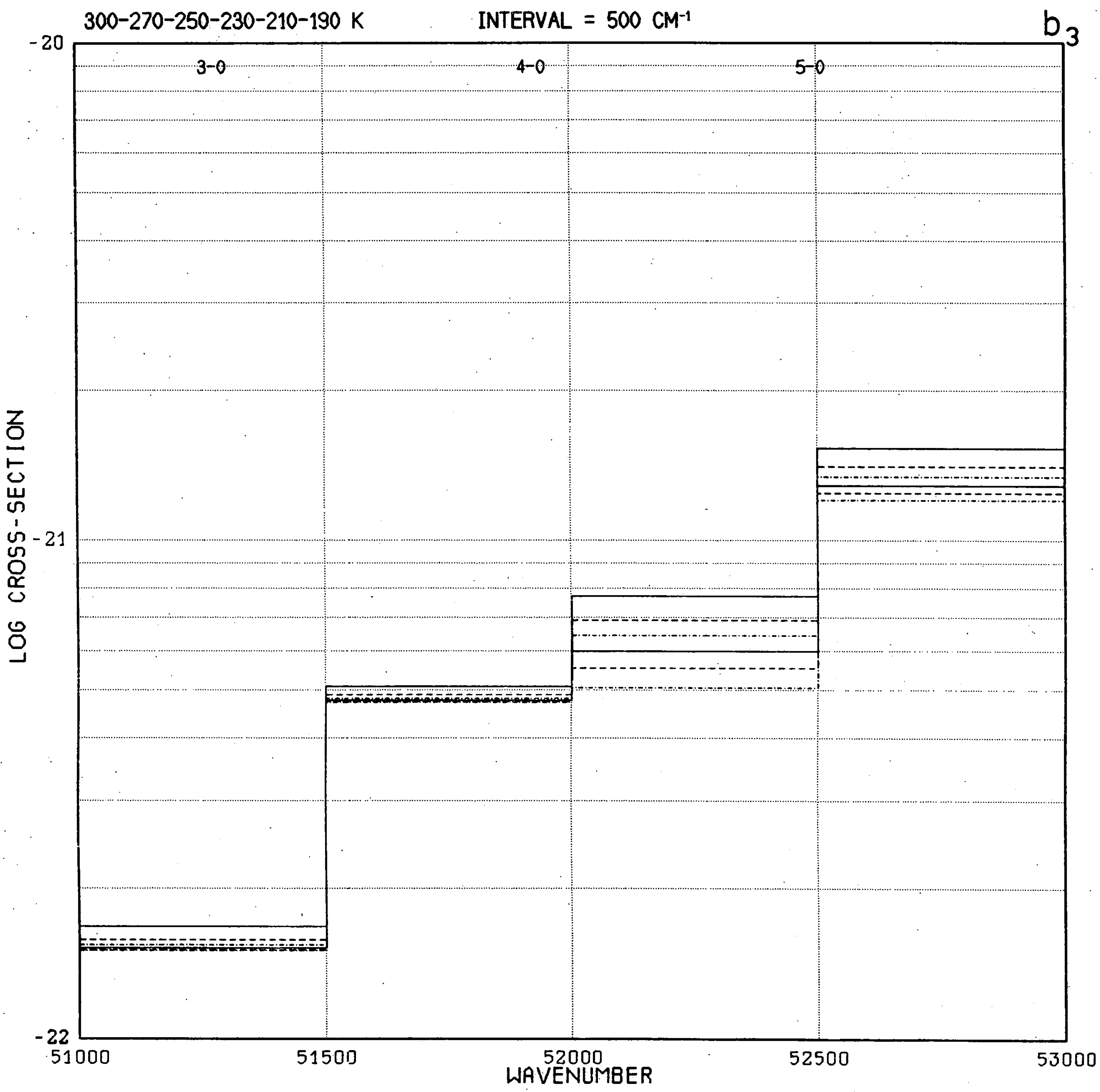
50000
50500
51000
WAVENUMBER


300-270-250-230-210-190 K
INTERVAL = 500 CM⁻¹
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LOG CROSS-SECTION
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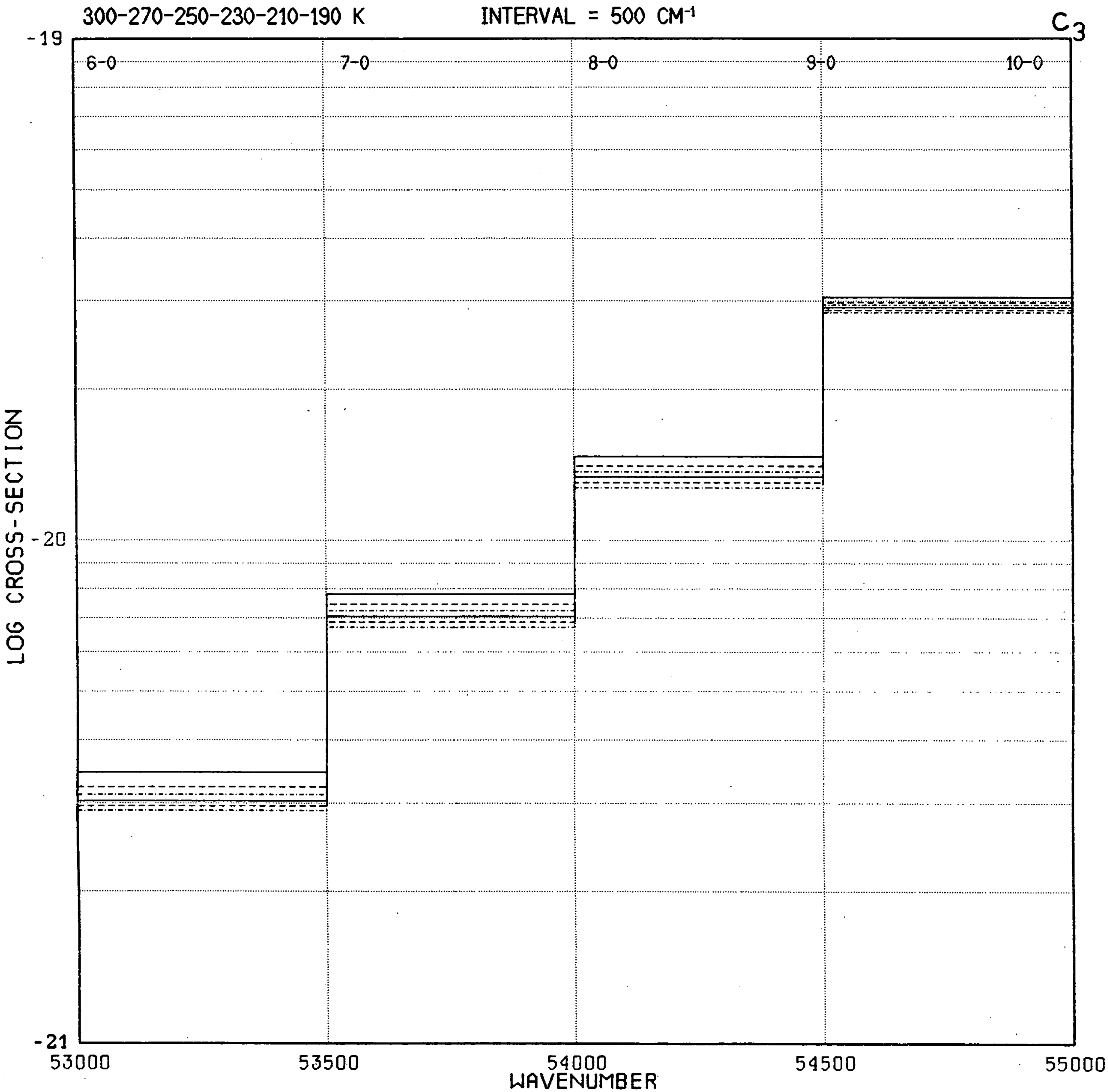
WAVENUMBER


300-270-250-230-210-190 K
INTERVAL = 500 CM-1
C3
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7-0
8-0
9-0
10-0
-19
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-21
LOG CROSS-SECTION
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54000
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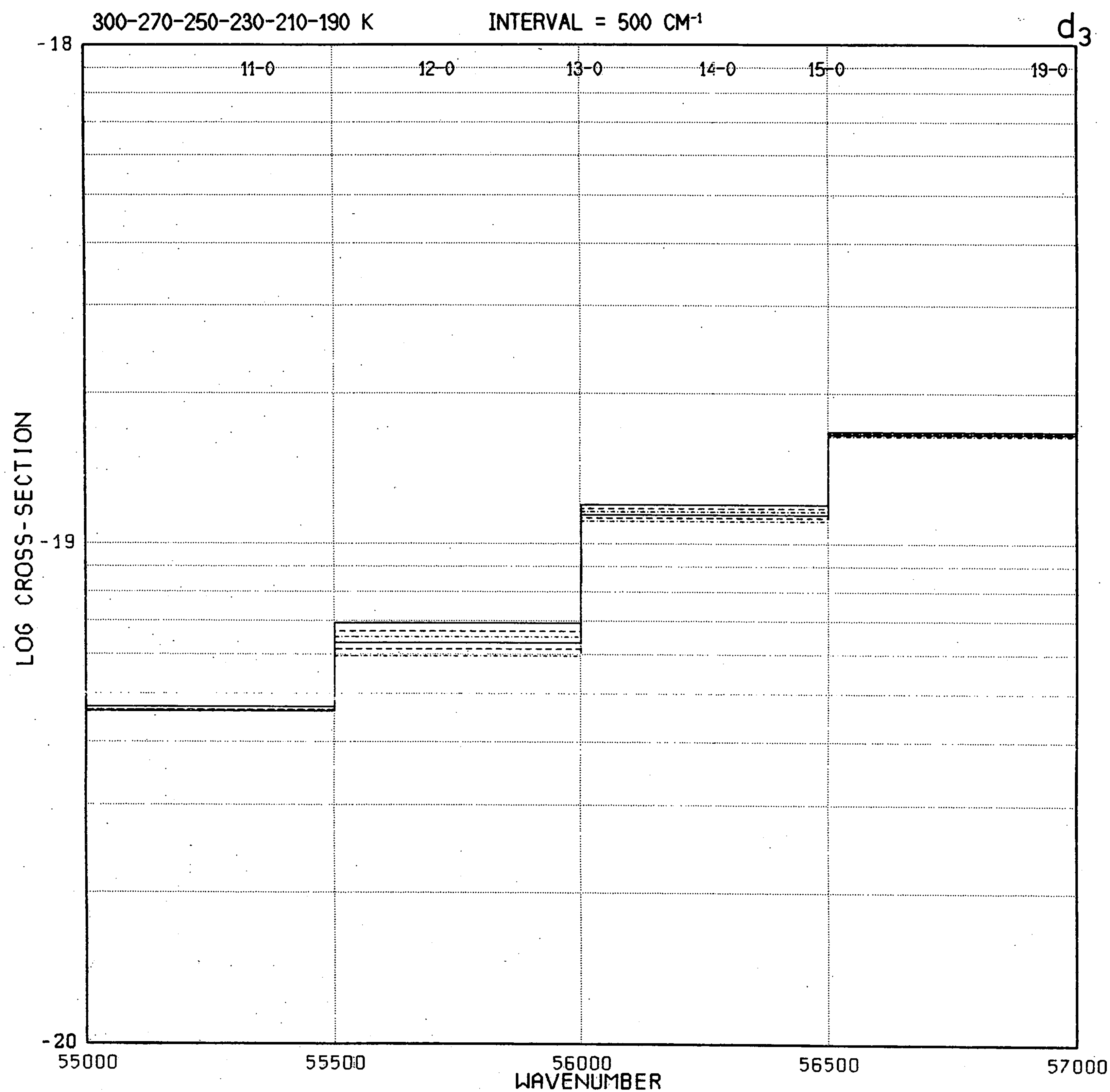
300-270-250-230-210-190 K
INTERVAL = 500 CM⁻¹
d3
11-0
12-0
13-0
14-0
15-0
19-0
-18
-19
-20
LOG CROSS-SECTION
55000
55500
56000
56500
57000
WAVENUMBER

THE BAND OSCILLATOR STRENGTHS

The Schumann-Runge bands analyzed many times have generated several determinations of their mean oscillator strengths. The values adopted here (Table 3) are based mainly on the recent results of the Cambridge and Canberra groups to generate a consistant set of data (Yoshino *et al.*, 1983; Cheung *et al.*, 1984; Yoshino *et al.*, 1987. Lewis *et al.* 1986) and also on the analysis of Allison *et al.* (1971). Since it is practically impossible to introduce an exact oscillator strength adapted to all circumstances, mean values have been adopted for each vibration level. The uncertainties should be generally less than 5% but could reach perhaps 5 to 10% for one or two bands. In any case, the values given in Table 3 must be considered as averaged band oscillator strengths to be adopted in order to determine the effective linewidths of the rotation lines corresponding to the various vibration levels from v' = 0 to v' = 19.

THE O_2 HERZBERG CONTINUUM

The absorption cross sections of the O_2 Herzberg continuum at wavelengths greater than 200 nm used before 1980 must be replaced now by experimental and observational results obtained recently (1984 - 1986). An analysis made by Nicolet and Kennes (1986, and 1987 to be published) leads to the adoption of an empirical formula for the absorption cross section, $\sigma_{HER}(O_2)$ cm^2,

$$\sigma_{HER}(O_2) = 7.5 \times 10^{-24} (\nu/5\times10^4) \exp \{-50 [\ln(\nu/5\times10^4)]^2\} \qquad (1)$$

Although the available sets of Herzberg continuum cross sections derived from laboratory measurements seem to reach an acceptable agreement with their experimental accuracy at wavelengths greater than 200 nm, the errors of the experimental or theoretical determinations prevent an exact extrapolation for the Herzberg continuum underlying the Schumann-Runge bands between 190 and 200 nm. Nevertheless, the stratospheric determinations are not in disagreement with the values deduced from the formula that we have adopted.

TABLE 3.- Adopted mean absorption oscillator strengths $f_{v''v'}$ for the Schumann-Runge bands of O_2 deduced from absorption spectra.

v'	$f_{0v'}$	$f_{1v'}$
0	2.8×10^{-10}	7.6×10^{-9}
1	3.0×10^{-9}	8.2×10^{-8}
2	1.9×10^{-8}	4.6×10^{-7}
3	8.2×10^{-8}	1.8×10^{-6}
4	2.7×10^{-7}	5.0×10^{-6}
5	7.4×10^{-7}	1.3×10^{-5}
6	1.6×10^{-6}	2.7×10^{-5}
7	3.4×10^{-6}	5.0×10^{-5}
8	6.2×10^{-6}	8.6×10^{-5}
9	1.0×10^{-5}	1.2×10^{-4}
10	1.5×10^{-5}	1.7×10^{-4}
11	1.9×10^{-5}	2.1×10^{-4}
12	2.4×10^{-5}	2.6×10^{-4}
13	2.7×10^{-5}	2.6×10^{-4}
14	2.8×10^{-5}	2.9×10^{-4}
15	2.7×10^{-5}	2.7×10^{-4}
16	2.6×10^{-5}	2.0×10^{-4}
17	2.2×10^{-5}	1.6×10^{-4}
18	1.7×10^{-5}	1.3×10^{-4}
19	1.3×10^{-5}	1.6×10^{-4}

TABLE 4.- Mean absorption cross sections of the O_2 Herzberg continuum deduced from formula (1)

Interval (cm^{-1})	Cross sections (cm^2)	Interval (cm^{-1})	Cross sections (cm^2)
49000-49500	7.2×10^{-24}	52000-52500	7.2×10^{-24}
49500-50000	7.4	52500-53000	7.0
50000-50500	7.5	53000-53500	6.7
50500-51000	7.5	53500-54000	6.4
51000-51500	7.5	54000-54500	6.0
51500-52000	7.4	54500-55000	5.6

THE O_2 SCHUMANN-RUNGE CONTINUUM

The photoabsorption continuum underlying the Schumann-Runge bands of vibration $v' > 10$ has been deduced almost exclusively from recent analysis (Lewis et al., 1985a,b).

The results of our approximate determination are given in Table 5 for temperatures between 170 K and 300 K, corresponding to the range of atmosphere and laboratory temperatures. This continuum related to the rotational and vibrational populations is subject to a strong variation with temperature and wavelength. The following averaged values of the absorption cross section at

	55250 cm^{-1}	and	55750 cm^{-1}
T = 170 K	3.1×10^{-23} cm^2		1.6×10^{-20} cm^2
T = 300 K	3.0×10^{-22} cm^2		3.8×10^{-20} cm^2

indicate a difference of a least a factor of 10^3. But its

TABLE 5.- Adopted decomposition off the absorption continuum (cm^2) for the Schumann-Runge bands of O_2 between (11-0) and (19-0) for temperatures from 170 K to 300 K.

Band	170 K	180 K	190 K	200 K	210 K	220 K	230 K
11-0	1.60×10^{-23}	1.75×10^{-23}	1.90×10^{-23}	2.10×10^{-23}	2.40×10^{-23}	2.90×10^{-23}	3.40×10^{-23}
12-0	1.50×10^{-22}	1.57×10^{-22}	1.65×10^{-22}	1.77×10^{-22}	1.80×10^{-22}	2.00×10^{-22}	2.45×10^{-22}
13-0	3.15	3.30	3.60	4.00	4.50	5.20	6.20
14-0	5.20	5.70	6.60	7.40	8.80	1.00×10^{-21}	1.20×10^{-21}
15-0	1.15×10^{-21}	1.40×10^{-21}	1.75×10^{-21}	2.10×10^{-21}	2.55×10^{-21}	3.00	3.55
16-0	4.00	5.00	5.60	6.60	7.50	8.70	1.00×10^{-20}
17-0	1.30×10^{-20}	1.50×10^{-20}	1.75×10^{-20}	1.90×10^{-20}	2.15×10^{-20}	2.25×10^{-20}	2.50
18-0	3.00	3.20	3.50	3.70	4.00	4.20	4.50
19-0	5.60	6.00	6.30	6.90	7.20	7.70	8.20

Band	240 K	250 K	260 K	270 K	280 K	290 K	300 K
11-0	4.10×10^{-23}	5.00×10^{-23}	6.00×10^{-23}	8.00×10^{-23}	1.17×10^{-22}	1.65×10^{-22}	2.00×10^{-22}
12-0	3.00×10^{-22}	3.70×10^{-22}	4.75×10^{-22}	6.00×10^{-22}	7.50	9.50	1.20×10^{-21}
13-0	7.50	9.00	1.10×10^{-21}	1.30×10^{-21}	1.43×10^{-21}	1.53×10^{-21}	1.60
14-0	1.40×10^{-21}	1.70×10^{-21}	1.90	2.20	2.40	2.70	3.00
15-0	4.00	4.60	5.10	5.80	6.30	6.60	7.00
16-0	1.17×10^{-20}	1.30×10^{-20}	1.40×10^{-20}	1.50×10^{-20}	1.62×10^{-20}	1.72×10^{-20}	1.80×10^{-20}
17-0	2.60	2.80	3.00	3.20	3.30	3.40	3.50
18-0	4.60	4.90	5.10	5.40	5.60	5.80	6.00
19-0	8.60	9.20	9.60	1.00×10^{-19}	1.05×10^{-19}	1.12×10^{-19}	1.20×10^{-19}

role is limited by the high absolute values of the absorption cross section of the rotational lines.

ROTATIONAL PREDISSOCIATION LINEWIDTHS

The measured high resolution absorption cross sections of the Schumann-Runge bands by Yoshino et al. (1983) between 201 nm and 179 nm have been adopted to determine the effective rotational linewidths. Even when experimental results may have exhibited systematic variations with rotation levels (Lewis et al., 1986) an equivalent band linewidth was adjusted to fit the experimental absolute cross sections after the introduction of the effect of an underlying continuum.

The Herzberg continuum plays an important role in the determination of the absorption cross sections of the first Schumann-Runge bands. The Schumann-Runge continuum is subject to a variation related to the population of the rotational and vibrational levels in the spectral range of the last bands near the normal continuum limit.

The best-fit model calculated values of the O_2 absorption cross sections with the experimental measurements have been used to determine the rotational linewidths adapted to each band. The adopted mean rotation linewidths are given in Table 6. The computation was made at each 0.1 cm^{-1} with a contributing spectral range of 500 cm^{-1} for a Voigt profile. Since realistic high resolution synthetic spectra require line centers to be located to within about 0.1 cm^{-1}, the wavenumbers obtained at each 0.1 cm^{-1} between 49000 cm^{-1} and 57000 cm^{-1} give the possibility to determine the detailed structure of the whole

TABLE 6.- Adopted mean rotation linewidths for the Schumann-Runge bands of O_2.

v'	cm^{-1}	v'	cm^{-1}
0	0.1	10	1.0
1	0.9	11	1.4
2	0.6	12	0.8
3	1.8	13	0.5
4	3.6	14	0.5
5	2.0	15	0.5
6	1.8	16	0.5
7	1.9	17	0.5
8	2.1	18	0.3
9	1.2	19	0.3

spectrum and to study the effect of temperature. In addition, the relative role of the underlying continua with their related accuracy can be investigated as a function of temperature and wavelength.

ABSORPTION CROSS SECTIONS

The calculated absorption cross sections of the Schumann-Runge bands of O_2 are presented in graphical format throughout the 49000-57000 cm^{-1} wavenumber region corresponding to all bands with v' = 0 to 19 and v" = 0 and 1 for T ≦ 300 K.

After each list covering an interval of 250 cm^{-1} of wavenumbers and associated vacuum wavelengths with a complete assignment of all principal P and R rotation lines (Tables I to XXXII), our calculated (v' = 0 to 19) absorption cross sections and the measured (v' = 2 to 12, v" = 0; v' = 3 to 19, v" = 1) cross sections of Yoschino et al. (1983) are shown as separate (250 cm^{-1}) linear plots in Figures I.1 to XXXII.1 with the principal identifications of rotation lines corresponding to the six main branches P(N) and R(N). As an example, Figure I.1 corresponding to the 49000 - 49250 cm^{-1} interval shows the principal identifications of the rotation lines of the 0-0 and 2-1 bands, from R15(0-0) to P21(0-0) and R1(2-1) to P13(2-1). Another example corresponding to the 56500 - 57000 interval shows the following rotation lines : P3(19-0) to R15(19-0), R1(18-0) and R1(17-0) to P9(17-0). In these various figures I.1 to XXXII.1 the comparison between the calculated and measured absorption cross section begins at 49750 cm^{-1}, 1-0 and 3-1 bands, and comes to an end at 55800 cm^{-1}, 12-0 and 19-1 bands.

After this linear plot displaying the principal features of the spectrum with their identification, the same results are illustrated by a semi-logarithmic plot of the absorption cross sections in Figures I.2 to XXXII.2. Such figures give the possibility to make a detailed comparison at 300 K between the calculated and measured cross sections. However, when the cross section between peaks of the various lines is less than 3×10^{-23}, from 49750cm^{-1} to a least 51500 cm^{-1}, the experimental structure must be considered as due to the noise occuring in the continuum for cross sections up to almost 10^{-22} cm^2. When all absorption cross sections are greater than 10^{-22} cm^2, there is an excellent agreement between the absolute measured and calculated cross sections at 300 K. Thus, in the spectral region where the absorption cross section is less than 5×10^{-23} cm^2, the role of the underlying continuum must be considered with particular attention.

The respective role of the lines and of the continuum in the O_2 absorption cross section can be seen in figures I.3 to XXXII.3, where variations of $\pm$ 10% and $\pm$ 20% in the underlying continuum are depicted. For example, such figures show clearly where the accuracy of the Herzberg continuum cross section should be improved (up to 51500 cm^{-1}).

Figures I.4 to XXXII.4 illustrate the diverse variations in the structure of the absorption spectrum for various temperatures, from the laboratory temperature 300 K to atmospheric temperatures 270, 230 and 190 K. It is possible to follow easily the marked variations with decreasing temperature in the absorption of the rotation lines starting from the vibration level v" = 1 and, therefore, to determine where and when, in the mesosphere and stratosphere, any mean absorption cross section is particularly sensitive to temperature.

Finally, Figures I.5 - 10 to XXXII.5-10 are included for temperatures of 300 K, 270 K, 250 K, 230 K, 210 K and 190 K, in order to define for each spectral interval the exact role of the underlying continuum at varying temperatures adapted to atmospheric conditions. Since, in each figure of this atlas, the spectrum covers 250 nm, it is possible to identify any line or any part of the continuum; 1 mm corresponds to 1 cm^{-1} of a synthetic spectrum determined at each 0.1 cm^{-1}.

THE SPECTRAL INTERVAL 49000 - 49500 cm^{-1}

This interval corresponds mainly to the spectral region of the 0-0 and 2-1 bands with minimum absorption cross sections less than 10^{-26} cm^2 and even less than 10^{-27} cm^2 at low temperature (Fig. I.5 to 10 and II.5 to 10). Thus, the averaged cross section depends strongly of the underlying continuum. The Herzberg continuum absorption cross section must be known with great accuracy. Figures I.3 and II.3 illustrate differences of $\pm$ 10 or $\pm$ 20% in the continuum cross section. These two figures give also an indication that the continuum cross section must be experimentally determined at low temperature in the spectral region of v' = 1 bands.

THE SPECTRAL INTERVAL 49500 - 50000 cm^{-1}

The 1-0 and 3-1 bands are the principal bands corresponding to this spectral interval with minimum cross sections at low temperature less than 10^{-26} cm^2 between 49500 and 49750 cm^{-1} (Fig. III.10) and less than 10^{-25} cm^2 between 49750 and 5000 cm^{-1} (Fig. IV. 10). The Herzberg continuum plays again a leading role (Fig. III.3 and IV.3) in the determination of the averaged cross section particularly in the 49500 - 49750 spectral interval (Fig. III.3).

A first comparison between experimental and theoretical absorption cross section at 300 K can be made in the 49750 - 50000 cl^{-1} region, particularly with the peaks of the rotational lines of the 1-0 band. It is clear, however, that the experimental noise persists at cross sections of the order of 10^{-23} cm^2 and cannot be used for a comparison with the Herzberg continuum between the rotational lines.

THE SPECTRAL INTERVAL 50000 - 50500 cm^{-1}

This region is characterized by the presence of the rotational lines (R ≧ 19) of 2-0 band and (R ≦ 9) of the 1-0 band with almost all the rotational lines of the 4-1 band. Such an overall pattern of absorption gives a structure very sensitive to temperature as it is illustrated in Figures V.4 and VI.4. No comparison is possible between the experimental and theoretical cross sections corresponding to the continuum or to the line wings below 2 x 10^{-23} cm^2. It can be noticed (Fig. V.10, for example) that the Herzberg continuum could be measured at low temperature between 50100 and 50300 cm^{-1}. Finally, it should be pointed out that the 50000 - 50500 cm^{-1} interval depends strongly on temperature and, therefore, the averaged absorption cross section related to the behavior of the 4-1 band with the predissociation line-width of its rotational lines.

THE SPECTRAL INTERVAL 50500 - 51000 cm^{-1}

Absolute experimental and theoretical absorption cross sections in this interval corresponding mainly to the 2-0 and 5-1 bands are given for T = 300 K in Fig. VII.1 and 2 and VIII.1 and 2. Again the experimental structure for absorption less than 2 x 10^{-23} cm^2 is due to the laboratory noise. The effect of the underlying continuum is still important in the region of the 2-0 band; it is easily detected, for example between 50500 and 50550 cm^{-1} as it is illustrated in Fig. VII.3. In the 50750 - 51000 cm^{-1} interval corresponding to the 5-1 band

(P3 to P17) the temperature effect is extremely important as shown in Fig. VIII.4 by the variation of the absorption cross section at 300, 270, 230 and 190 K, respectively. It should be pointed out that the absorption cross section of the Herzberg continuum could be measured at low temperature between 50750 and 50850 cm^{-1}, i.e. near 197 nm. In that interval where the window region between the rotational lines of the 5-1 band reaches 2×10^{-25} cm^2 at 190 K, there is, therefore, a notable difference with the absorption cross section corresponding to the Herzberg continuum which cannot be less than 5×10^{-24} cm^2.

THE SPECTRAL INTERVAL 51000 - 51500 cm^{-1}

In this interval where the linewidths of the rotational lines of the 3-0 band play an increasing role in the overall pattern of absorption, the accuracy required for the underlying continuum is less critical than in the region of the wavenumbers less than 51000 cm^{-1}. Fig. IX.3 shows the relative importance of variations of $\pm$ 10 to 20% in the continuum cross section. It is also clear that, in the same spectral region, the wings of many lines give a detectable contribution to the effective absorption cross section of the whole interval. Fig. IX.4 shows that the variation with temperature (300 K to 190 K) of the pseudo-continuum between the peak of the lines is of the same order of magnitude as a variation of 10 to 20% of the Herzberg continuum cross section (Fig. IX.3). Nevertheless, the role of the underlying continuum is far from negligible (see Fig. IX.5 to 10). Between 51350 and 51500 cm^{-1} the importance of the 6-1 band (Fig. X) is related to its variation with temperature (Fig. X.4) and to the increasing relative importance of the Herzberg continuum with decreasing temperature Fig. X.5 to 10). The mean absorption cross section at 190 K near 51400 - 51500 cm^{-1} is of the order of 10^{-23} cm^2 where the pseudocontinuum between the P13 - R15 and P11 - R13 lines of the 6-1 band is only 2×10^{-24} cm^2 near 51450 cm^{-1}, i.e. 119.4 nm.

THE SPECTRAL INTERVAL 51500 - 52000 cm^{-1}

Figures XI.1 and 2, and XII.1 and 2, present the experimental and theoretical data for the 4-0 band and also portions of the 7-1 and 6-1 bands. The role of the Herzberg continuum is almost practically negligible between 52000 and 51750 cm^{-1} (Fig. XII.3 and 5 to 10) where the wings of the rotational lines contribute to the total absorption cross section. Between 51750 and 51500 cm^{-1} for the (R ≧ 19) lines of the 4-0 band and the first rotational lines of the 6-1 band, the variation with temperature (Fig. XI.4) must still be compared with an effect of the Herzberg continuum (Fig. XI.5 to 10). For example, at 51750 cm^{-1} if T = 190 K, the effective continuum of the order of 10^{-23} cm^2 between the P21 and P23 lines of the 4-0 band is associated with a pseudo-continuum of 3×10^{-24} cm^2 and corresponds to the wings of these two lines. At T = 270 K, the pseudocontinuum corresponds to an equivalent cross section of about 7×10^{-23} cm^2 since the rotational population increases with temperature.

THE SPECTRAL INTERVAL 52000 - 52500 cm^{-1}

The comparison between experimental and theoretical data at 300 K is illustrated for this interval in Figures XIII.1 and 2 and Figures XIV.1 and 2. The differences with and without an underlying continuum are small, practically, negligible, in the spectral range 52500 - 52250 cm^{-1} corresponding mainly to the P9 - R11,..., P19 - R21 rotational lines of the 5-0 band with a mean predissociaton linewidth of 2 cm^{-1}. Since the wings of the lines contribute to the absorption with a pseudocontinuum of about 10^{-22} cm^2 at 300 K, an underlying continuum even of the order of 7×10^{-24} cm^2 cannot play a consequent role. But in the spectral region corresponding to 52100 - 52250 cm^{-1} interval where the minimum cross sections, at 300 K, reach 2×10^{-23} cm^2 between the peaks of the P21 - R23 and P25 - R27 lines of the 5-0 band, the contribution of the Herzberg continuum to the absorption cross section particularly at low temperature is not negligible (Fig. XXII.5 to 10). On the other hand, in the same spectral region, the effect of temperature (Fig. XIII.4) on the rotational structure is particularly significant since it corresponds to the lines of the 7-1 band and to the last rotational lines of the 5-0 band.

THE SPECTRAL INTERVAL 52500 - 53000 cm^{-1}

This interval corresponds to an addition of rotational lines belonging to various bands (Fig. XV and XVI.1 and 2) : 6-0 band with $P \geqq 13$, 5-0 band with $R \leqq 9$, 9-1 band with $P \geqq 9$ and 8-1 band with $R \geqq 1$ to $R \leqq 11$). The Herzberg continuum plays a minor or a negligible role since the minimum absorption cross sections seem to coincide with a pseudocontinuum associated with a normal contribution of the wings of the various lines. The variation of the absorption cross sections of this pseudocontinuum are closely associated with the variation of temperature. Figures XV.4 and XVI.4 are an illustration of the variation of the spectral structure for temperatures 300 K, 270 K, 230 K and 190 K.

THE SPECTRAL INTERVAL 53000 - 53500 cm^{-1}

The contributions of the 6-0 band, R1 to R13, of the 7-0 band, P15 to P29, and of the 9-1 band, R1 to R9, and of the 10-1 band, R1 to R25, determine the structure of the absorption cross sections at room temperature illustrated in Figures XVII.1 and 2 and XVIII.1 and 2. The variation of the averaged absorption cross section is explained by the alteration of the vibrational and rotational structures between 300 K and 190 K (Fig. XVII.4 and particularly Fig. XVIII.4). An effect of the Herzberg continuum is outside of the range of detection.

THE SPECTRAL INTERVAL 53500 - 54000 cm^{-1}

Figures XIX and XX corresponding to the 7-0 band (R1 to R15) with the 8-0 band (R15 to R29) and to the 11-1 band (R1 to R21) with the 12-1 band ($R \geqq 17$) indicate that the principal variation of the averaged absorption cross section depends on temperature; this variation is particularly apparent in the spectral region 53700 -53900 cm^{-1} where the minimum cross section (Fig. XX.4) may vary by a factor of 10, between 10^{-22} and 10^{-21} cm^2 for T = 190 K and T = 300 K, respectively.

THE SPECTRAL INTERVAL 54000 - 54500 cm^{-1}

The two main bands of this 500 cm^{-1} interval are the 8-0 band from R1 to R13 and the 9-0 band from R13 to R29. Three bands from the vibrational level v" = 1 belong to the same interval, namely the 12-1 band from R1 to R15, the 13-1 band from P5 to R23 and the 14-1 band from P17 to R27 (Fig. XXI and XXII). The averaged absorption cross section at 300 K is greater than 10^{-20} cm^2 and the variation of the structure is associated only with the rotational and vibrational populations related to temperature (300 K to 190 K) particularly in the 54150 - 54350 cm^{-1} region.

THE SPECTRAL INTERVAL 54500 - 55000 cm^{-1}

The 10-0 band (P7 to P23) and the 9-0 band (R1 to P9) are the two main bands of this interval with an addition of at least 6 bands starting from v" = 1. The structure of the following bands is measured and calculated : 14-1 from R1 to P17, 15-1 from R1 to R21, 16-1 from R13 to R25, 17-1 from R17 to P25, 18-1 from P19 to P27 and 19-1 from P19 to R27.

The variation of the absorption cross sections at 300 K (Fig. XXIII.2 and XXIV.2) is of the order of 10^4, from about 4×10^{-22} cm^2 near 182.9 nm corresponding to P17 of the 15-1 band to 4×10^{-18} cm^2 at the peak of the R9 - P7 lines of 10-0 band near 181.8 nm, i.e. for about 1 nm interval (Fig. XXIII.5 to 10, and Fig. XXIV.5 to 10).

THE SPECTRAL INTERVAL 55000 - 55500 cm^{-1}

This interval is characterized by almost all rotational lines (R1 to R23) of the 11-0 band with the first lines (R1 to R7) of the 10-0 band and with the last lines (P17 to R29) of the 12-0 band. Four bands with vibrational levels v" = 1 are also present in the same spectral region. They are : 16-1 band from R1 to P11, 17-1 band from R1 to P15, 18-1 band from R1 to R17 and 19-1 band from R1 to R19 (Fig. XXV.1 and 2, Fig. XXVI.1 and 2).

The effect of the Schumann-Runge continuum can be detected, see for example, Fig. XXVI.3 and 5. Since the absorption cross section of this continuum is related to the vibrational and rotational populations, it is consequently a complicated function of temperature. Its effect decreases from 300 K to 190 K. This is depicted in Figures XXVI.5 to 10 by the variation of the absorption cross sections near 55485 cm^{-1} for temperatures decreasing from 300 K to 190 K. The averaged absorption cross section for this 500 cm^{-1} interval reaches almost 5×10^{-20} cm^2 when the minimum cross section at 190 K is only 4×10^{-22} cm^2 near 55120 cm^{-1} between the P19 and R19 lines of the 11-0 band (Fig. XXV.10) and the associated maximum cross section comes to 6×10^{-19} cm^2 near 55400 cm^{-1} (Fig. XXVI.10) at the peak of the R7 line of the 10-0 band.

THE SPECTRAL INTERVAL 55500 - 56000 cm^{-1}

This spectral region is the last interval where a direct comparison between the experimental and theoretical values can be made. This comparison ends with the 12-0 band at 55785 cm^{-1} (179.26 nm). The rotational structure of the 12-0 band in the 55785 - 55500 cm^{-1} interval corresponds to the rotational lines between R1 and R17 (Fig. XXVII.1 and 2 for R1 to P5 and Fig. XXVIII.1 and 2 for R7 to R17). However, the 13-0, 14-0 and 15-0 bands are also present in this 500 cm^{-1} interval by various portions of their rotational structure. The 13-0 band has an important part corresponding to rotational lines between P9 and R25, but the experimental data begin only at P17. The 14-0 band with rotational lines between R19 and R29 is only measured in the laboratory between P25 and R29. The 15-0 band with its lines between P23 and R29 is practically beyond the present detailed laboratory measurements.

This spectral interval has a distinctive peculiarity by the absence of rotational lines from the vibrational level v" = 1, since the calculation ended with 19-1 in the preceding interval near 55468 cm^{-1} at the rotational line R1.

The temperature effect is the result of a combination of a variation due to the Schumann-Runge continuum (increase with temperature) and a variation related to the rotational structure of various bands (See Fig. XXVII.3 and 4 with Fig. XXVII.5 to 10, and Fig. XXVIII.3 and 4 with Fig. XXXVIII.5 to 10). The averaged absorption cross section in this 500 cm^{-1} interval reach 7×10^{-20} cm^2 at 300 K and the extreme low and high values are 10^{-21} cm^2 and 10^{-18} cm^2, respectively.

THE SPECTRAL INTERVAL 56000 - 56500 cm^{-1}

Seven bands are involved in this interval, namely the 13-0 band from R1 to P7, the 14-0 band from R1 to P17, the 15-0 band from R7 to R23, the 16-0 band from R15 to P25, the 17-0 band from P17 to R27, the 18-0 band from P19 to P27 and the 19-0 band from P21 to P27 (Fig. XXIX and XXX).

Among all these bands the 14-0 and 15-0 bands play the principal roles in this 500 cm^{-1} interval where the averaged absorption cross section is greater than 10^{-19} cm^2. It is expected that the individual structure of all components are not very accurate but the number of possible errors due to various causes does not allow a classification of all uncertainties.

THE SPECTRAL INTERVAL 56500 - 57000 cm^{-1}

In this last 500 cm^{-1} interval (Fig. XXXI and XXXII) illustrated in the atlas we must consider at least all the first rotational lines of the 15-0 to 19-0 bands, namely 15-0 from R1 to R7, 16-0 from R1 to P13, 17-0 from R1 to R17, 18-0 from R1 to P19, and 19-0 from P3 to P19. The effect of the Schumann-Runge continuum must be introduced in the calculation with its temperature dependence (Fig. XXXI and XXXII.5 to 10).

Because of various uncertainties, detailed characterization of the theoretical results is difficult. The adopted equivalent linewidths depend essentially on the analysis of rotational lines from vibrational levels v" = 1 which may be equivocal. The total uncertainty which is difficult to quantify could reach perhaps several tens per-cent.

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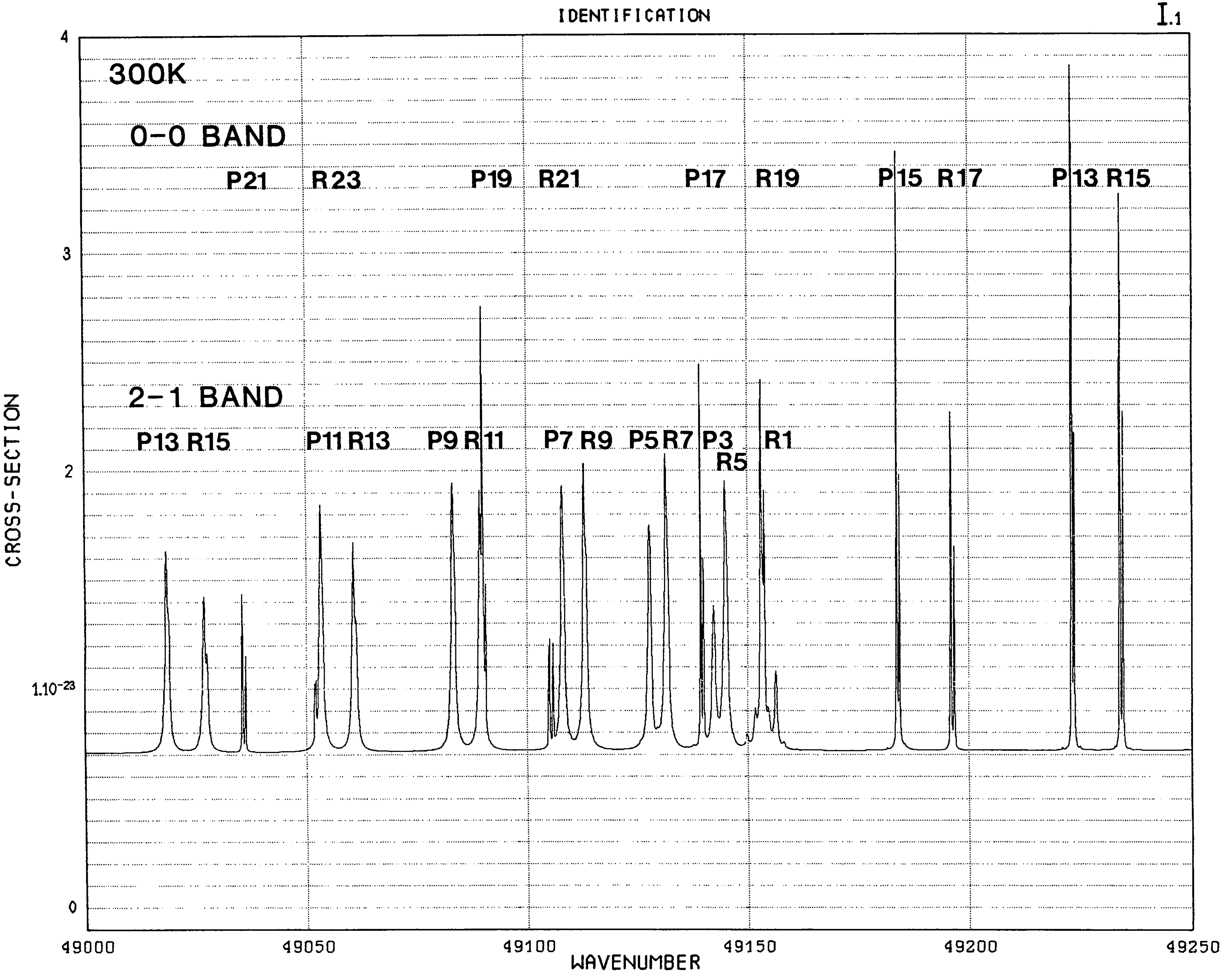
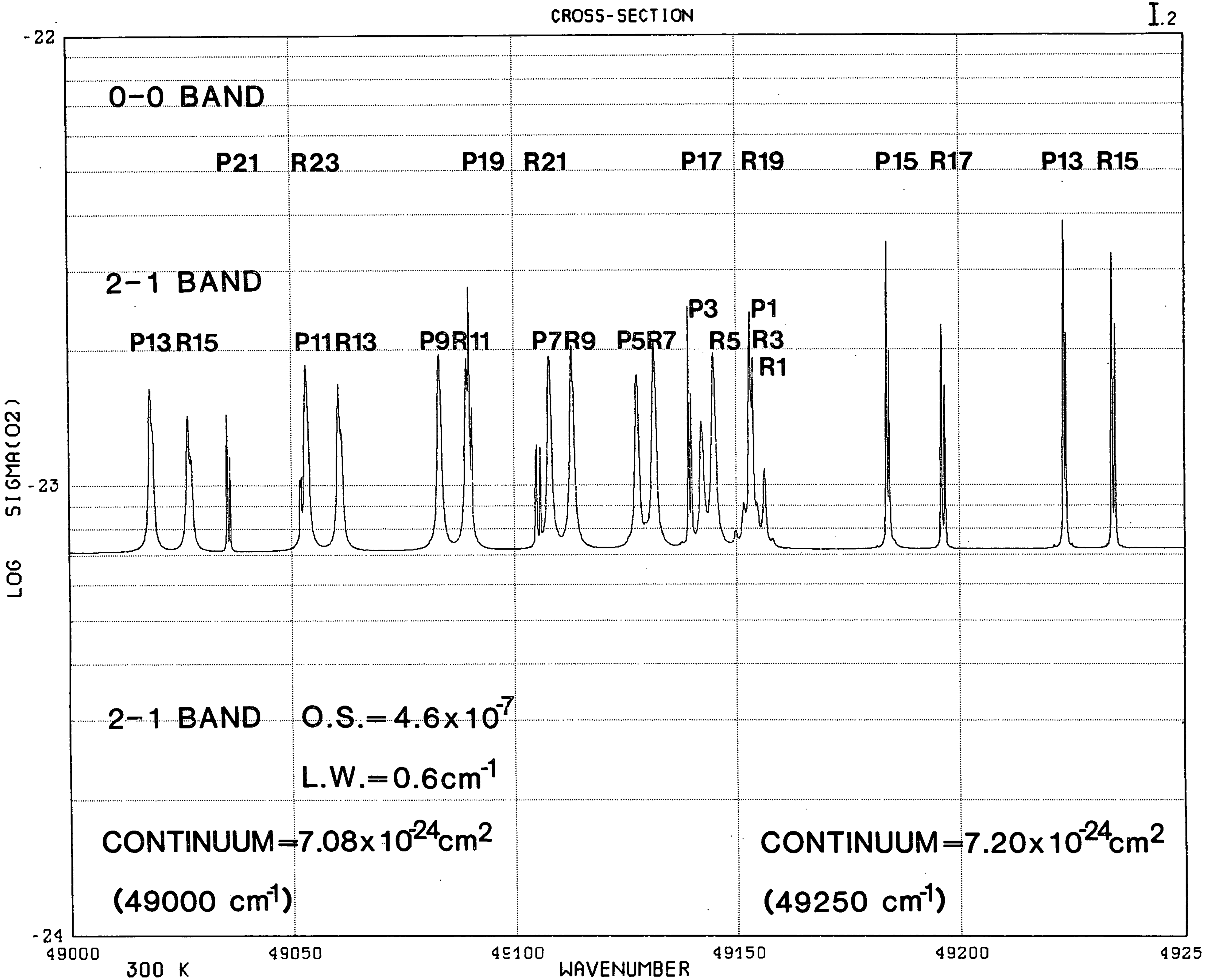
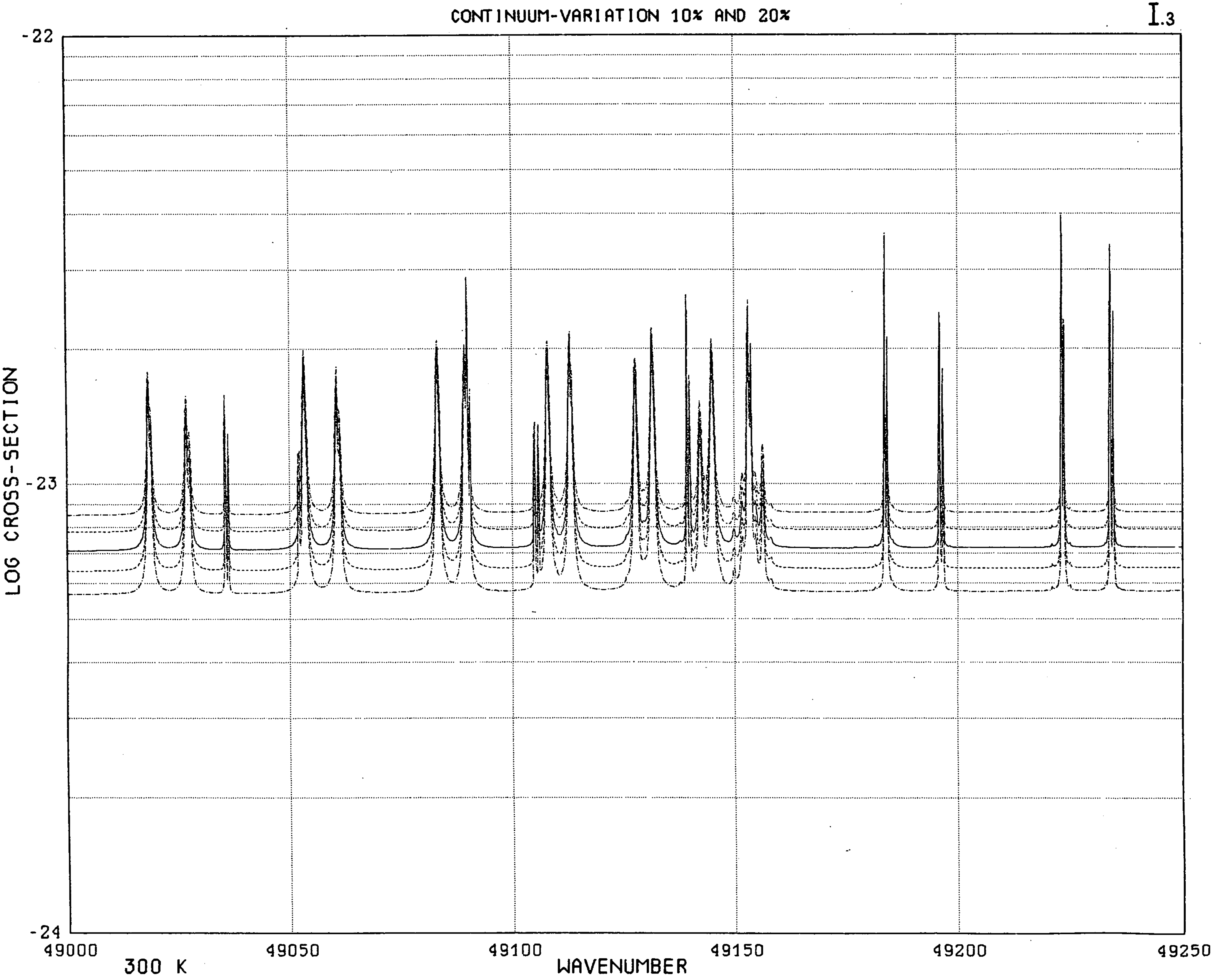
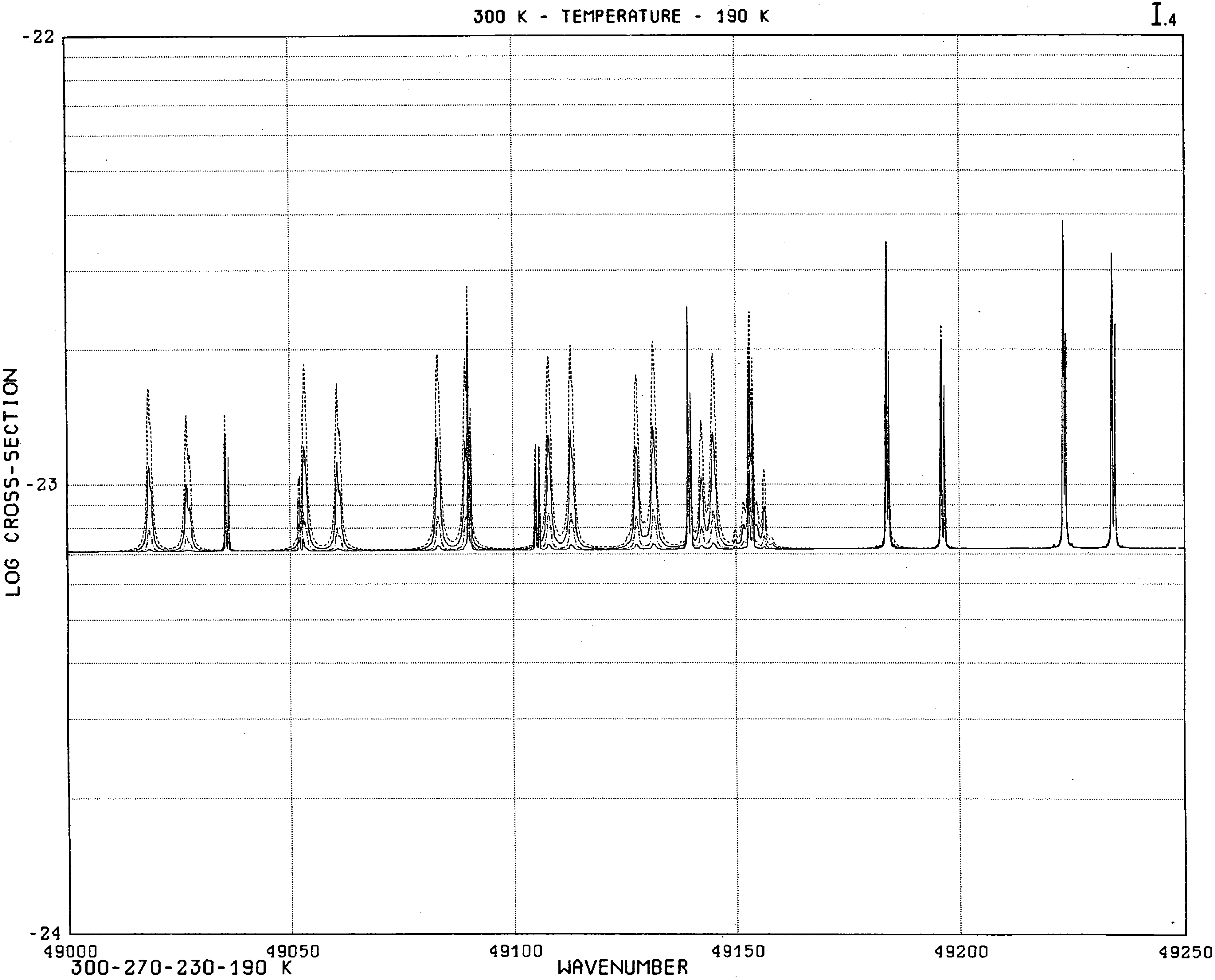
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
49000 - 49250 cm^{-1}

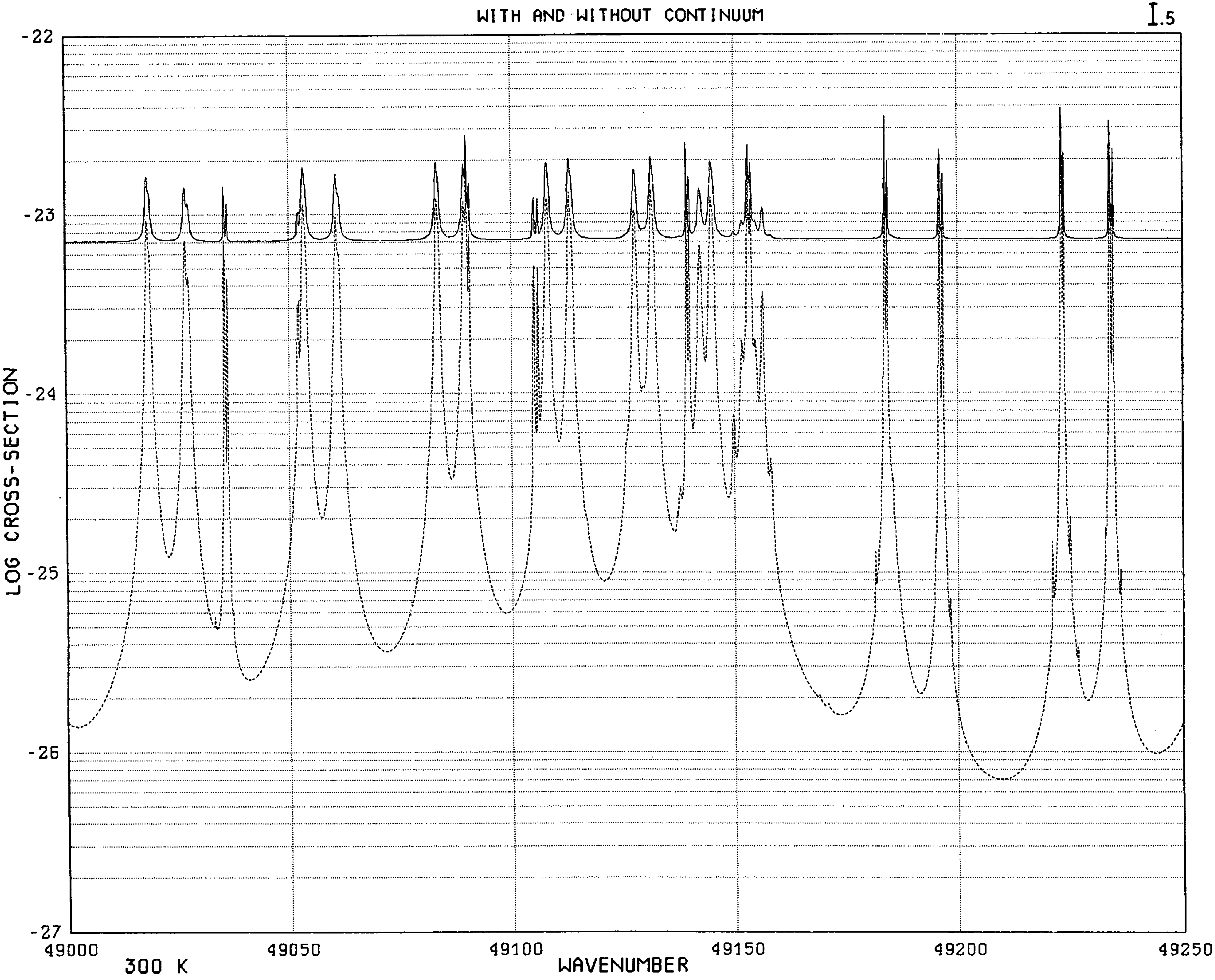
ν	λ	band
49000		
49018.3	2040.05	2-1 P13
49018.3	2040.05	2-1 P13
49018.9	2040.03	2-1 P13
49026.7	2039.70	2-1 R15
49026.8	2039.70	2-1 R15
49027.5	2039.67	2-1 R15
49035.5	2039.34	0-0 P21
49035.5	2039.34	0-0 P21
49036.2	2039.31	0-0 P21
49050		
49051.9	2038.66	0-0 R23
49052.2	2038.65	0-0 R23
49053.0	2038.61	0-0 R23
49053.2	2038.60	2-1 P11
49053.3	2038.60	2-1 P11
49053.8	2038.58	2-1 P11
49060.6	2038.30	2-1 R13
49060.6	2038.29	2-1 R13
49061.3	2038.27	2-1 R13
49083.1	2037.36	2-1 P 9
49083.2	2037.36	2-1 P 9
49083.6	2037.34	2-1 P 9
49089.3	2037.10	2-1 R11
49089.3	2037.10	2-1 R11
49089.9	2037.08	0-0 P19
49089.9	2037.08	2-1 R11
49089.9	2037.08	0-0 P19
49090.6	2037.05	0-0 P19
49100		
49104.9	2036.46	0-0 R21
49105.1	2036.45	0-0 R21
49105.9	2036.42	0-0 R21
49107.9	2036.33	2-1 P 7
49108.0	2036.33	2-1 P 7
49108.3	2036.32	2-1 P 7
49112.9	2036.12	2-1 R 9
49112.9	2036.12	2-1 R 9
49113.5	2036.10	2-1 R 9
49127.5	2035.52	2-1 P 5
49127.7	2035.51	2-1 P 5
49128.0	2035.50	2-1 P 5
49131.4	2035.36	2-1 R 7
49131.5	2035.35	2-1 R 7
49131.9	2035.34	2-1 R 7
49139.3	2035.03	0-0 P17
49139.4	2035.03	0-0 P17
49139.9	2035.00	0-0 P17
49142.1	2034.91	2-1 P 3
49142.3	2034.91	2-1 P 3
49142.6	2034.89	2-1 P 3
49144.8	2034.80	2-1 R 5
49144.9	2034.80	2-1 R 5
49145.3	2034.78	2-1 R 5
49150		
49151.8	2034.51	2-1 P 1
49153.0	2034.47	0-0 R19
49153.1	2034.46	0-0 R19
49153.2	2034.45	2-1 R 3
49153.6	2034.44	2-1 R 3
49154.7	2034.39	2-1 Q 1
49156.3	2034.32	2-1 R 1
49156.4	2034.32	2-1 R 1
49183.8	2033.19	0-0 P15
49183.8	2033.19	0-0 P15
49184.3	2033.17	0-0 P15
49184.5	2033.16	3-1 P29
49185.3	2033.13	3-1 P29
49196.0	2032.69	0-0 R17
49196.1	2032.68	0-0 R17
49196.8	2032.65	0-0 R17
49200		
49223.2	2031.56	0-0 P13
49223.3	2031.56	0-0 P13
49223.8	2031.54	0-0 P13
49234.0	2031.12	0-0 R15
49234.1	2031.11	0-0 R15
49234.7	2031.09	0-0 R15

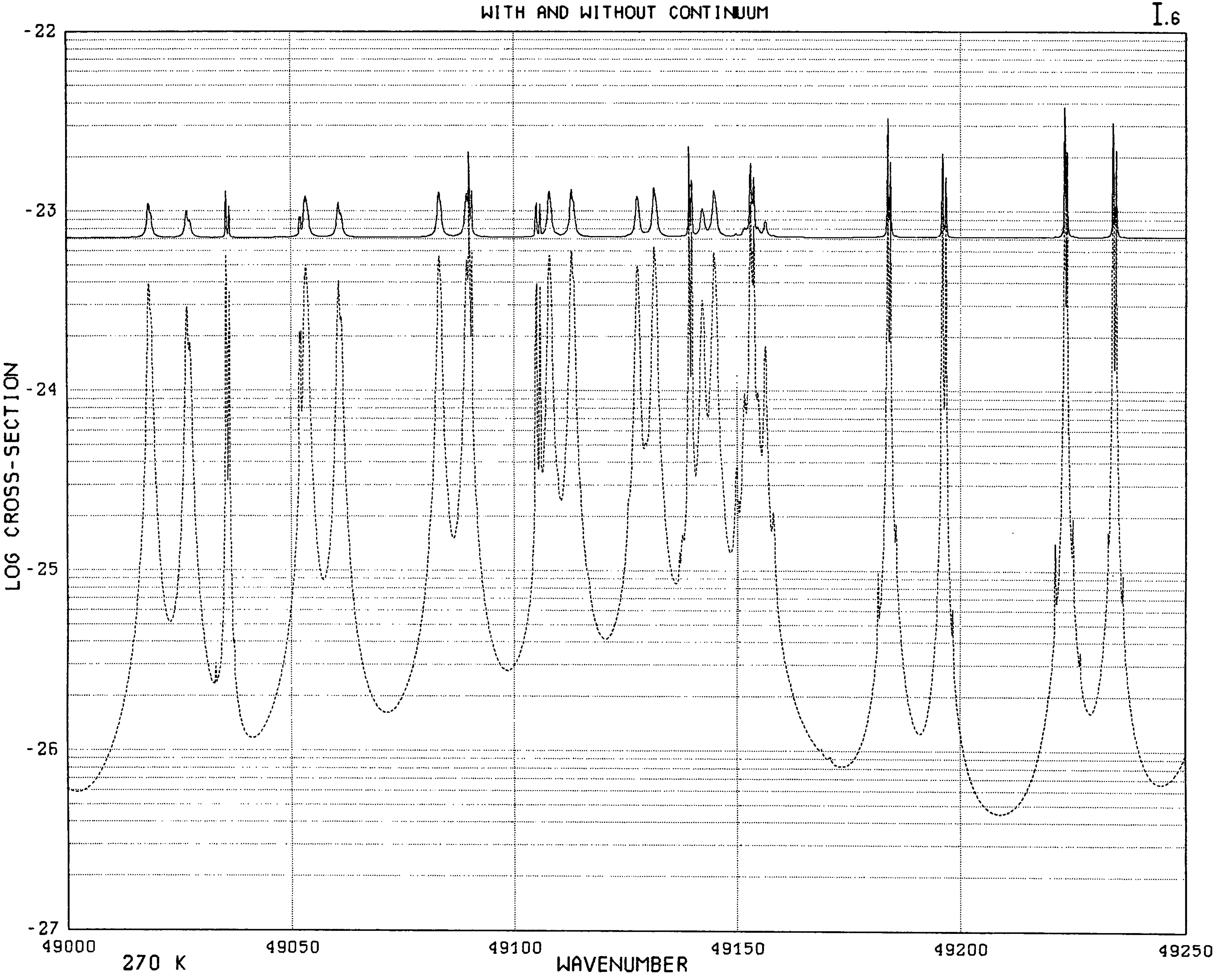

IDENTIFICATION
300K
0-0 BAND
P21 R23 P19 R21 P17 R19 P15 R17 P13 R15
2-1 BAND
P13 R15 P11 R13 P9 R11 P7 R9 P5 R7 P3 R5 R1
CROSS-SECTION
4
3
2
1.10-23
0
49000
49050
49100
49150
49200
49250
WAVENUMBER


CROSS-SECTION
0-0 BAND
P21 R23
P19 R21
P17 R19
P15 R17
P13 R15
2-1 BAND
P13 R15
P11 R13
P9 R11
P7 R9
P5 R7
P3
R5
P1
R3
R1
2-1 BAND O.S.=4.6x10^-7
L.W.=0.6cm^-1
CONTINUUM=7.08x10^-24 cm^2
(49000 cm^-1)
CONTINUUM=7.20x10^-24 cm^2
(49250 cm^-1)
LOG SIGMA(O2)
-22
-23
-24
49000
49050
49100
49150
49200
49250
300 K
WAVENUMBER

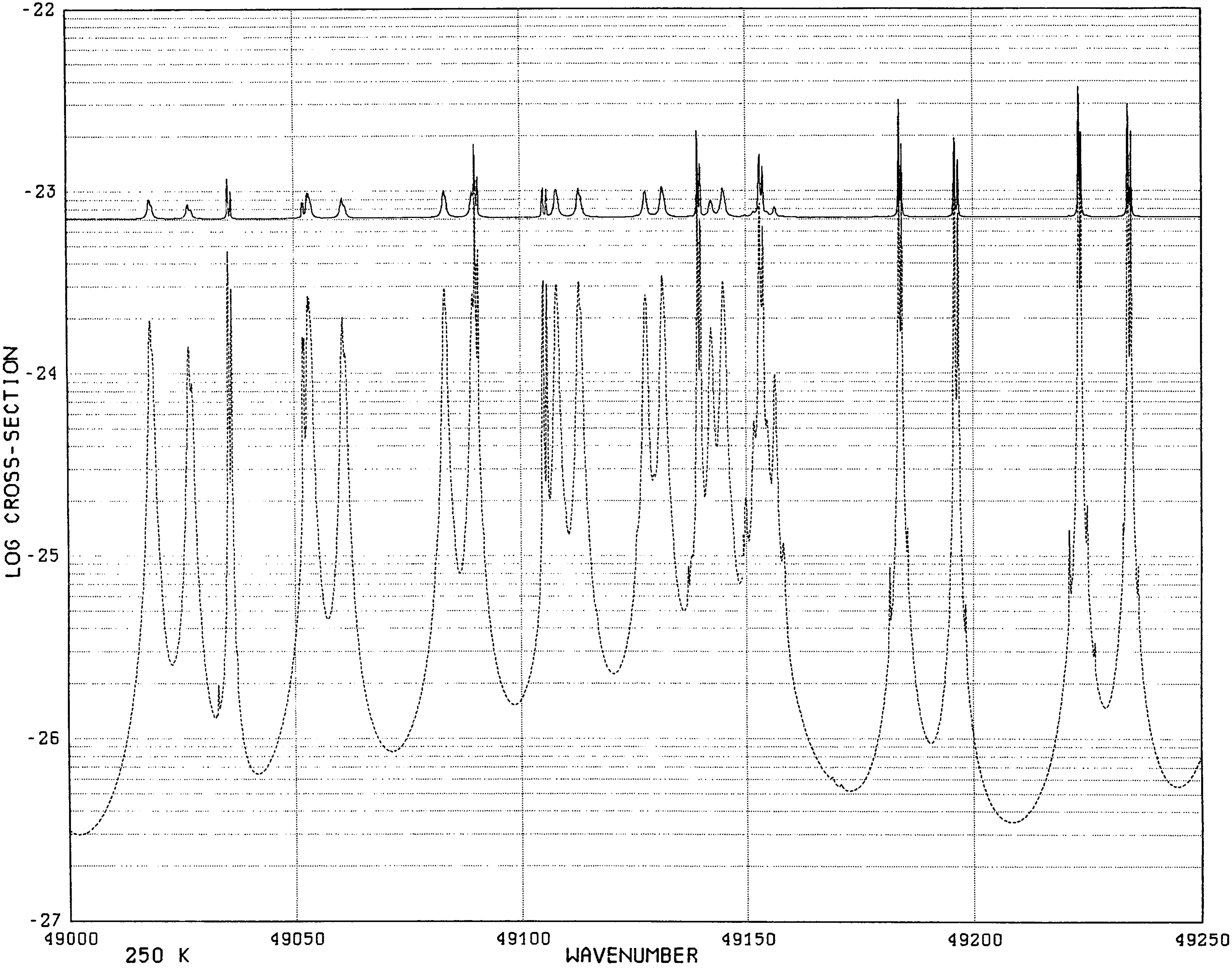

CONTINUUM-VARIATION 10% AND 20%
-22
-23
-24
LOG CROSS-SECTION
49000
49050
49100
49150
49200
49250
300 K
WAVENUMBER


300 K - TEMPERATURE - 190 K
I.4
-22
-23
-24
LOG CROSS-SECTION
49000
49050
49100
49150
49200
49250
300-270-230-190 K
WAVENUMBER

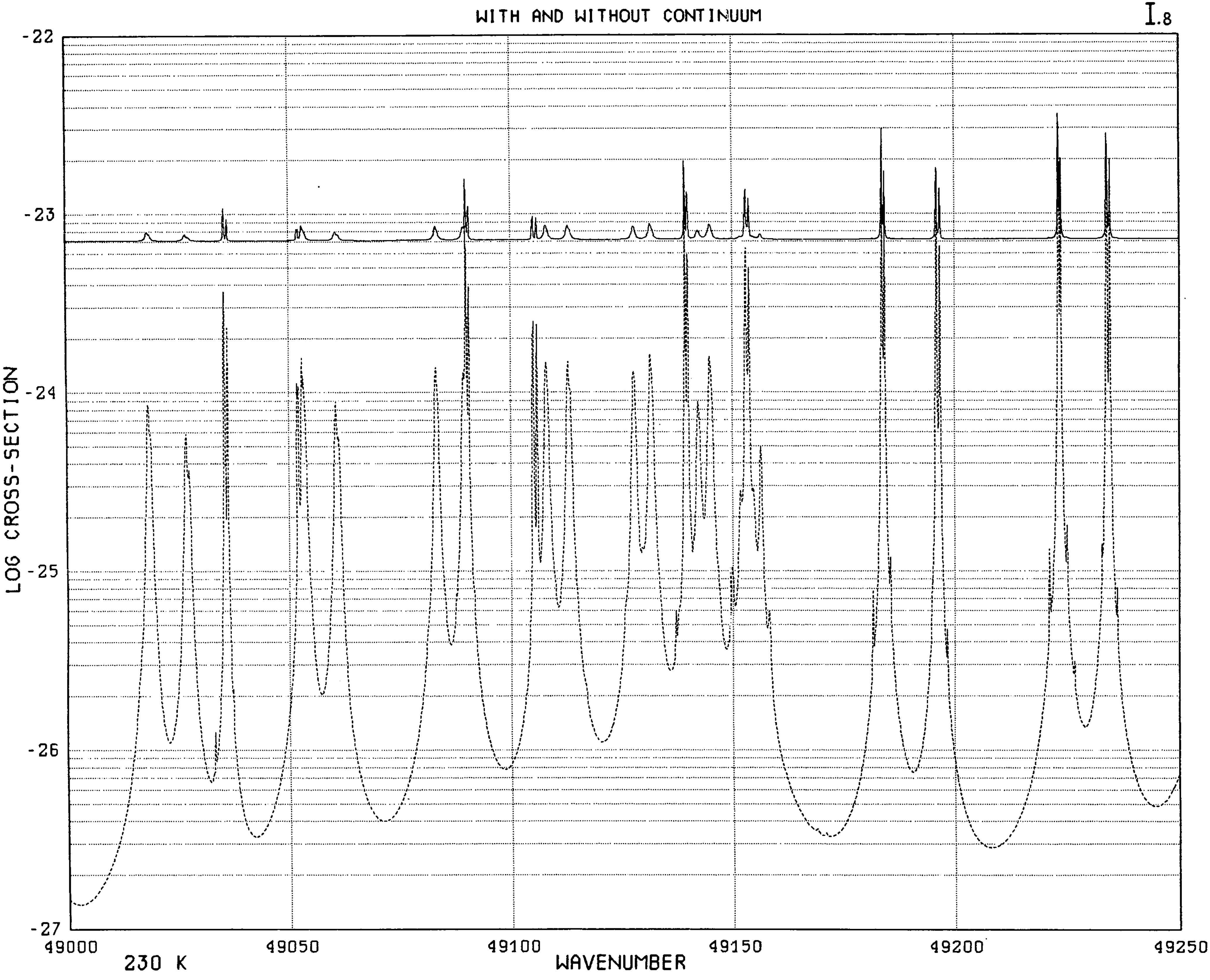

WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
-26
-27
LOG CROSS-SECTION
49000
49050
49100
49150
49200
49250
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
-26
-27
LOG CROSS-SECTION
49000
49050
49100
49150
49200
49250
270 K
WAVENUMBER

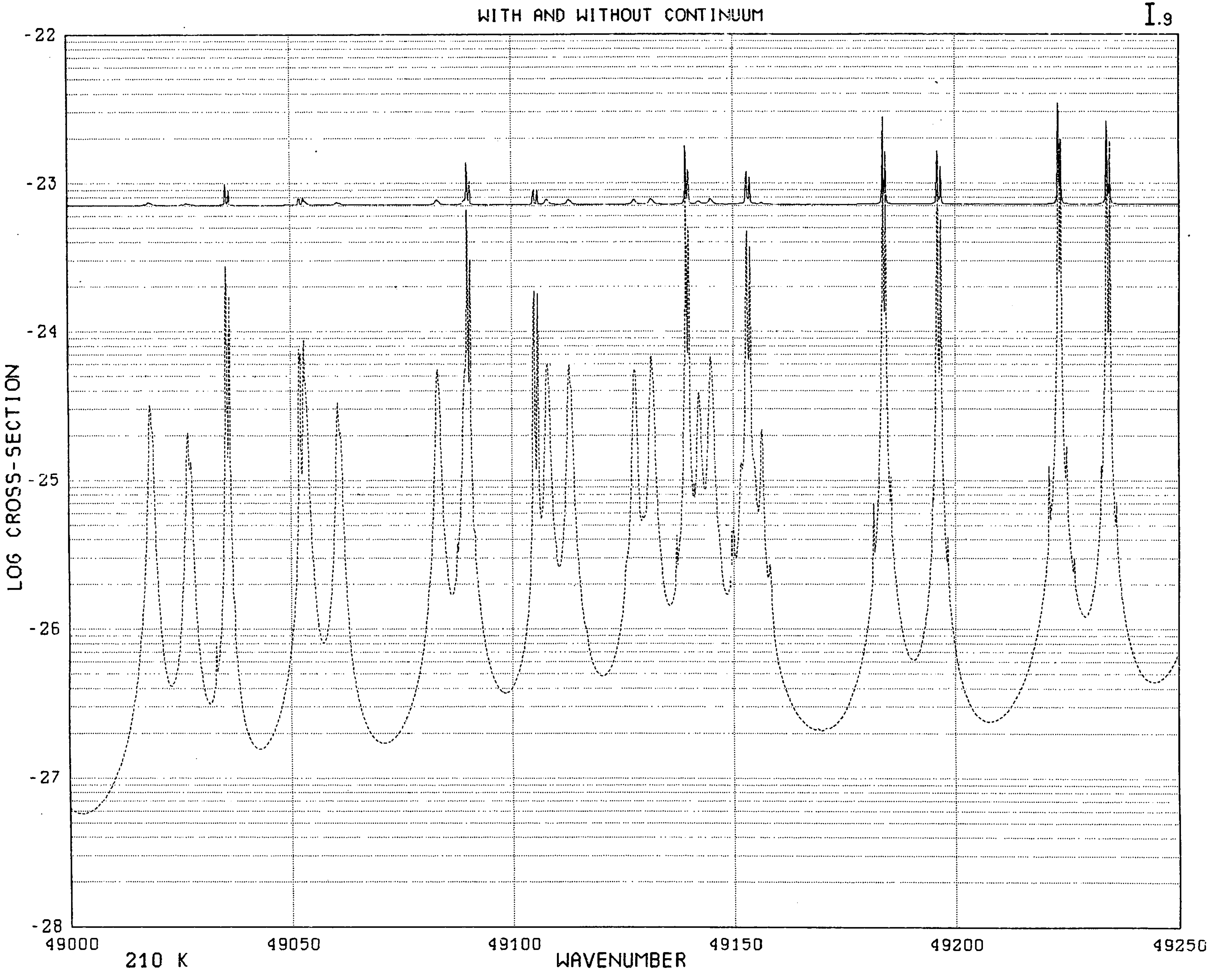
WITH AND WITHOUT CONTINUUM

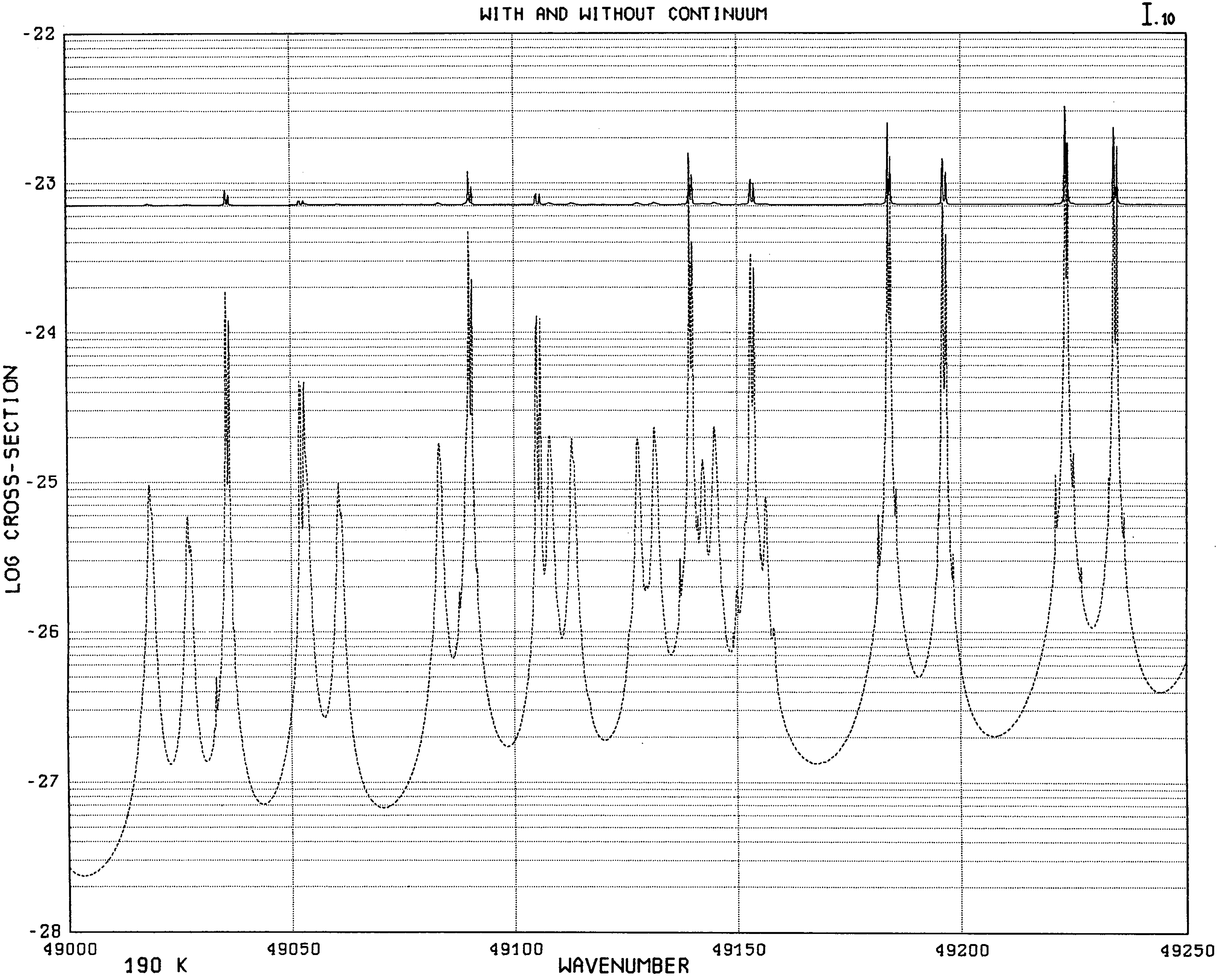


I.8



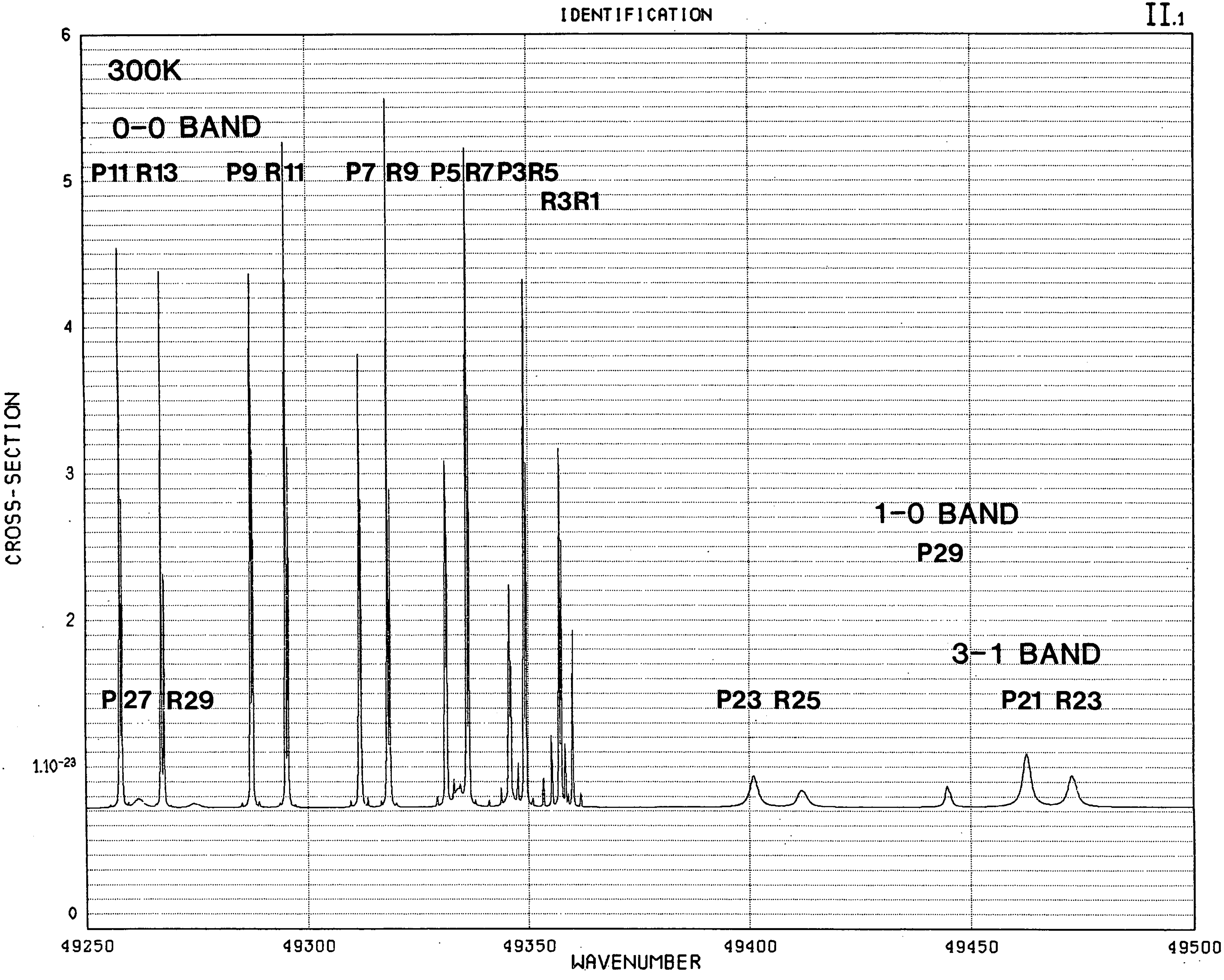
WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-22
-23
-24
-25
-26
-27
49000
49050
49100
49150
49200
49250
230 K
WAVENUMBER

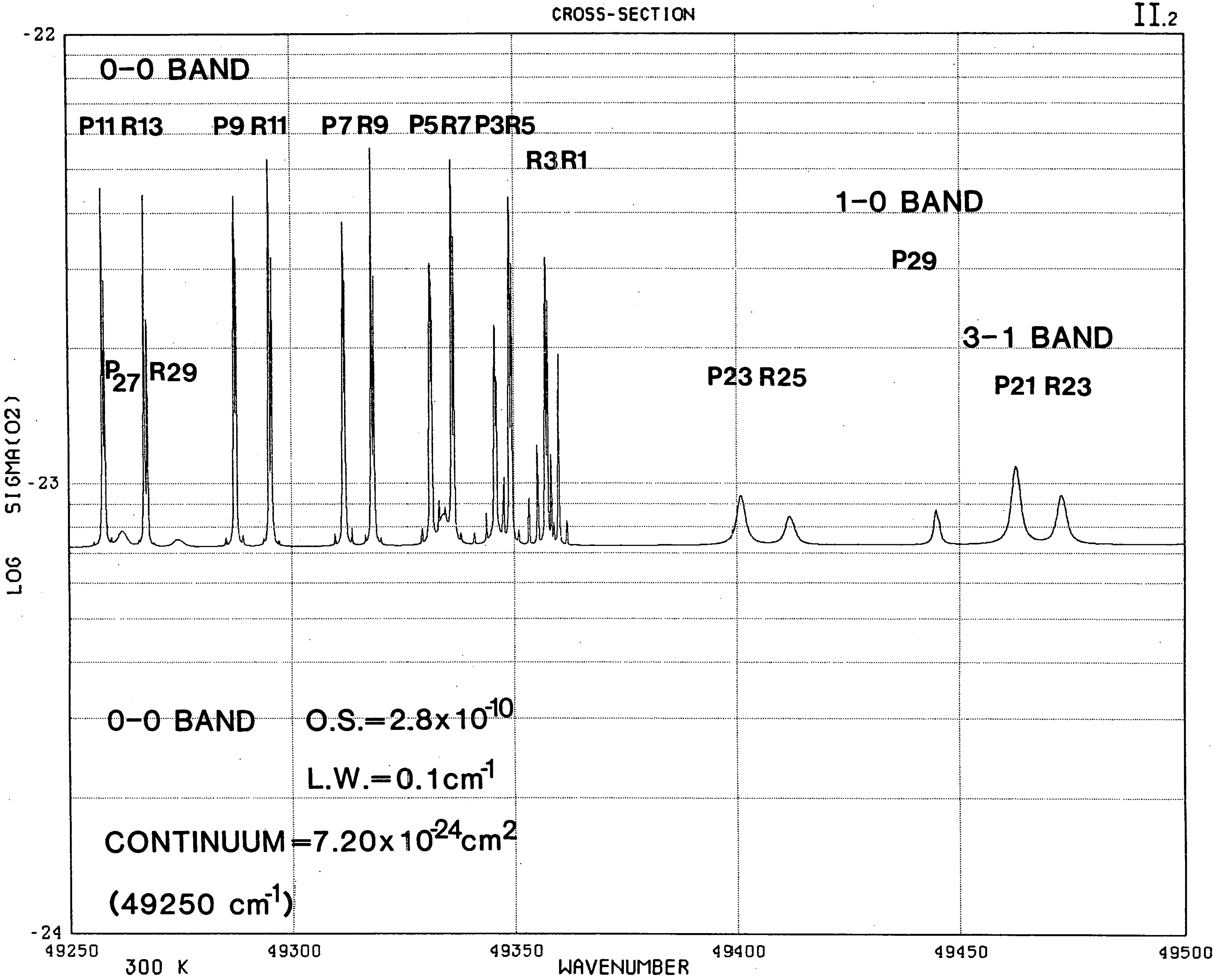

WITH AND WITHOUT CONTINUUM
I.9
-22
-23
-24
-25
-26
-27
-28
LOG CROSS-SECTION
49000
49050
49100
49150
49200
49250
210 K
WAVENUMBER

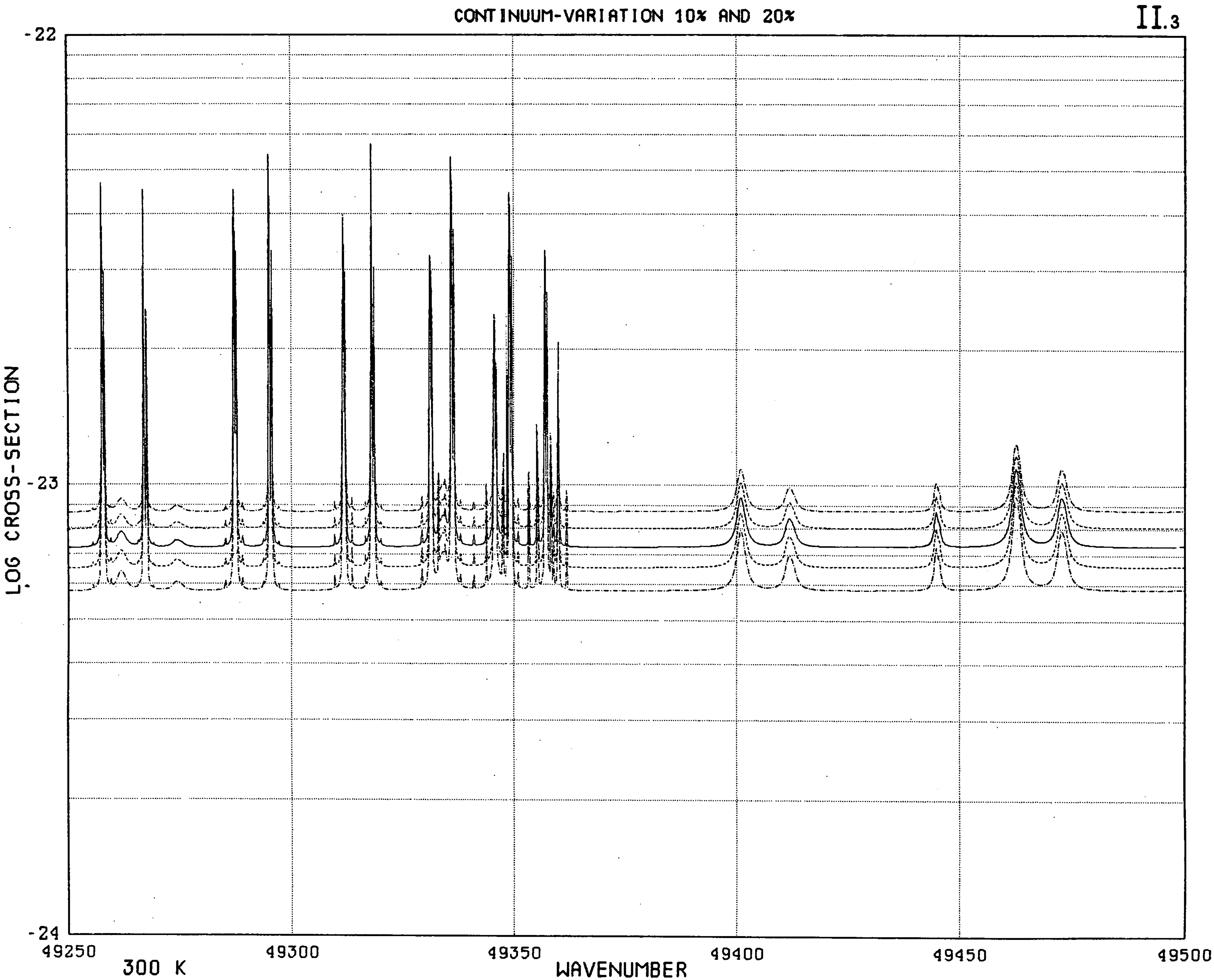

WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
-26
-27
-28
LOG CROSS-SECTION
49000
49050
49100
49150
49200
49250
190 K
WAVENUMBER

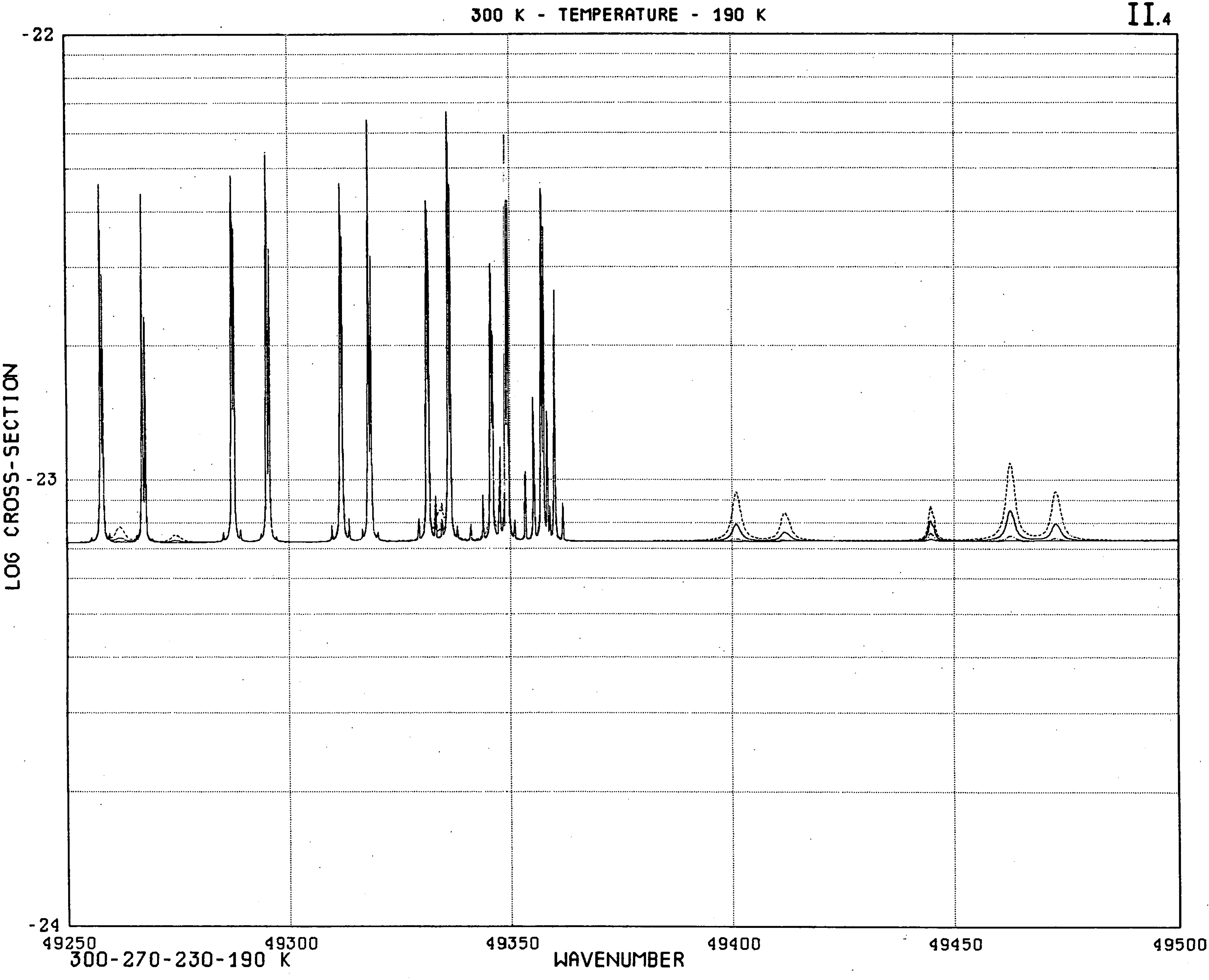
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
49250 - 49500 cm^{-1}

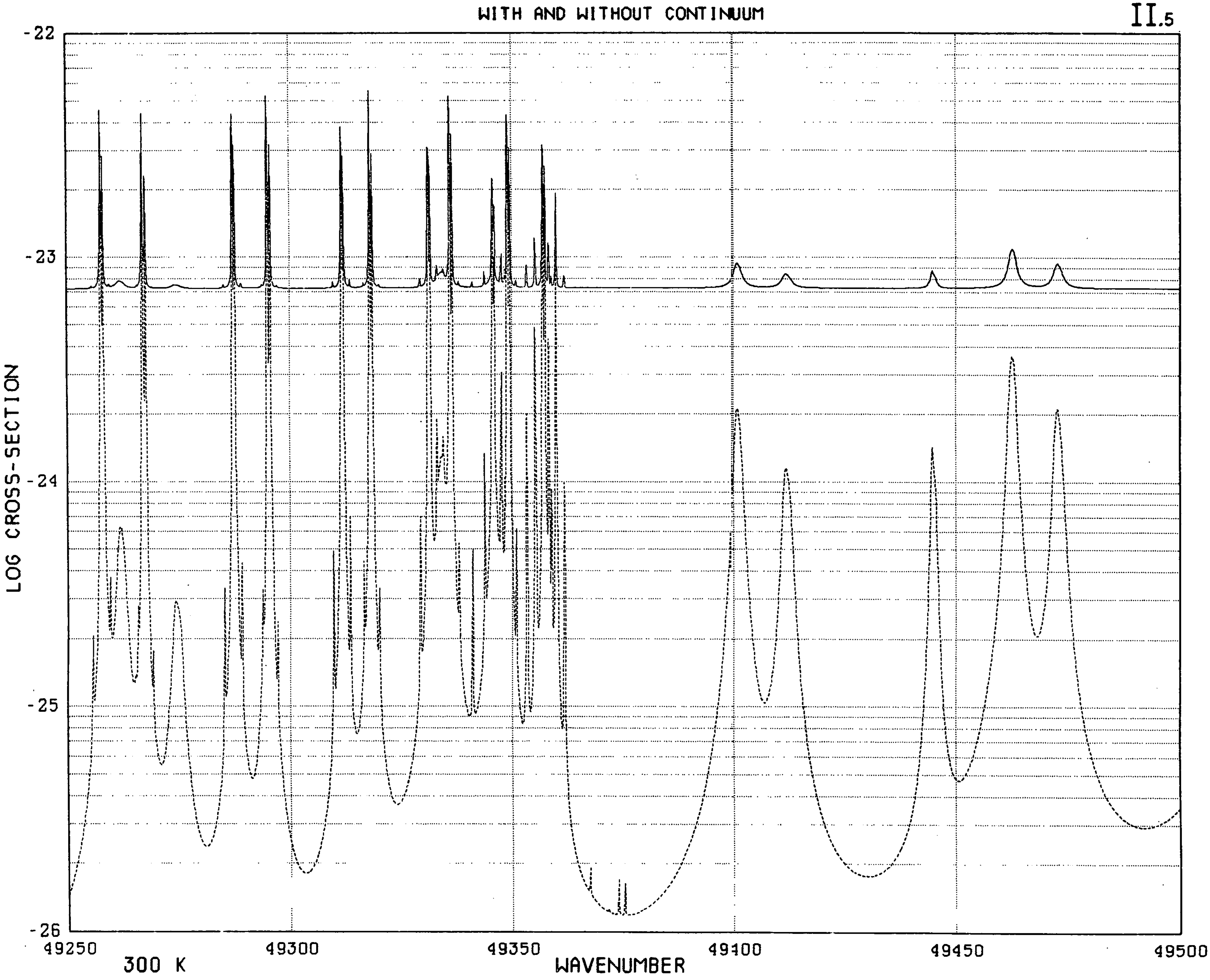
ν	λ	band
49250		
49257.7	2030.14	0-0 P11
49257.7	2030.14	0-0 P11
49258.2	2030.12	0-0 P11
49261.6	2029.98	3-1 P27
49261.8	2029.97	3-1 P27
49262.6	2029.94	3-1 P27
49267.0	2029.76	0-0 R13
49267.0	2029.76	0-0 R13
49267.6	2029.73	0-0 R13
49274.0	2029.47	3-1 R29
49274.4	2029.45	3-1 R29
49275.3	2029.41	3-1 R29
49287.1	2028.93	0-0 P 9
49287.2	2028.92	0-0 P 9
49287.6	2028.91	0-0 P 9
49295.0	2028.60	0-0 R11
49295.0	2028.60	0-0 R11
49295.6	2028.58	0-0 R11
49300		
49311.6	2027.92	0-0 P 7
49311.7	2027.91	0-0 P 7
49312.1	2027.90	0-0 P 7
49318.0	2027.66	0-0 R 9
49318.0	2027.65	0-0 R 9
49318.5	2027.63	0-0 R 9
49331.1	2027.12	0-0 P 5
49331.3	2027.11	0-0 P 5
49331.5	2027.10	0-0 P 5
49333.8	2027.01	3-1 P25
49333.9	2027.00	3-1 P25
49334.6	2026.97	3-1 P25
49336.0	2026.92	0-0 R 7
49336.1	2026.91	0-0 R 7
49336.5	2026.90	0-0 R 7
49345.4	2026.53	3-1 R27
49345.6	2026.52	0-0 P 3
49345.7	2026.52	3-1 R27
49345.8	2026.52	0-0 P 3
49346.0	2026.51	0-0 P 3
49346.6	2026.48	3-1 R27
49349.0	2026.38	0-0 R 5
49349.1	2026.38	0-0 R 5
49349.5	2026.36	0-0 R 5
49350		
49355.2	2026.13	0-0 P 1
49357.0	2026.06	0-0 R 3
49357.1	2026.05	0-0 R 3
49357.5	2026.04	0-0 R 3
49358.3	2026.00	0-0 Q 1
49360.0	2025.93	0-0 R 1
49360.1	2025.93	0-0 R 1
49400		
49400.7	2024.26	3-1 P23
49400.8	2024.26	3-1 P23
49401.5	2024.23	3-1 P23
49411.5	2023.82	3-1 R25
49411.8	2023.81	3-1 R25
49412.7	2023.77	3-1 R25
49444.6	2022.46	1-0 P29
49444.7	2022.46	1-0 P29
49445.4	2022.43	1-0 P29
49450		
49462.4	2021.74	3-1 P21
49462.5	2021.73	3-1 P21
49463.1	2021.71	3-1 P21
49472.5	2021.33	3-1 R23
49472.7	2021.32	3-1 R23
49473.5	2021.28	3-1 R23

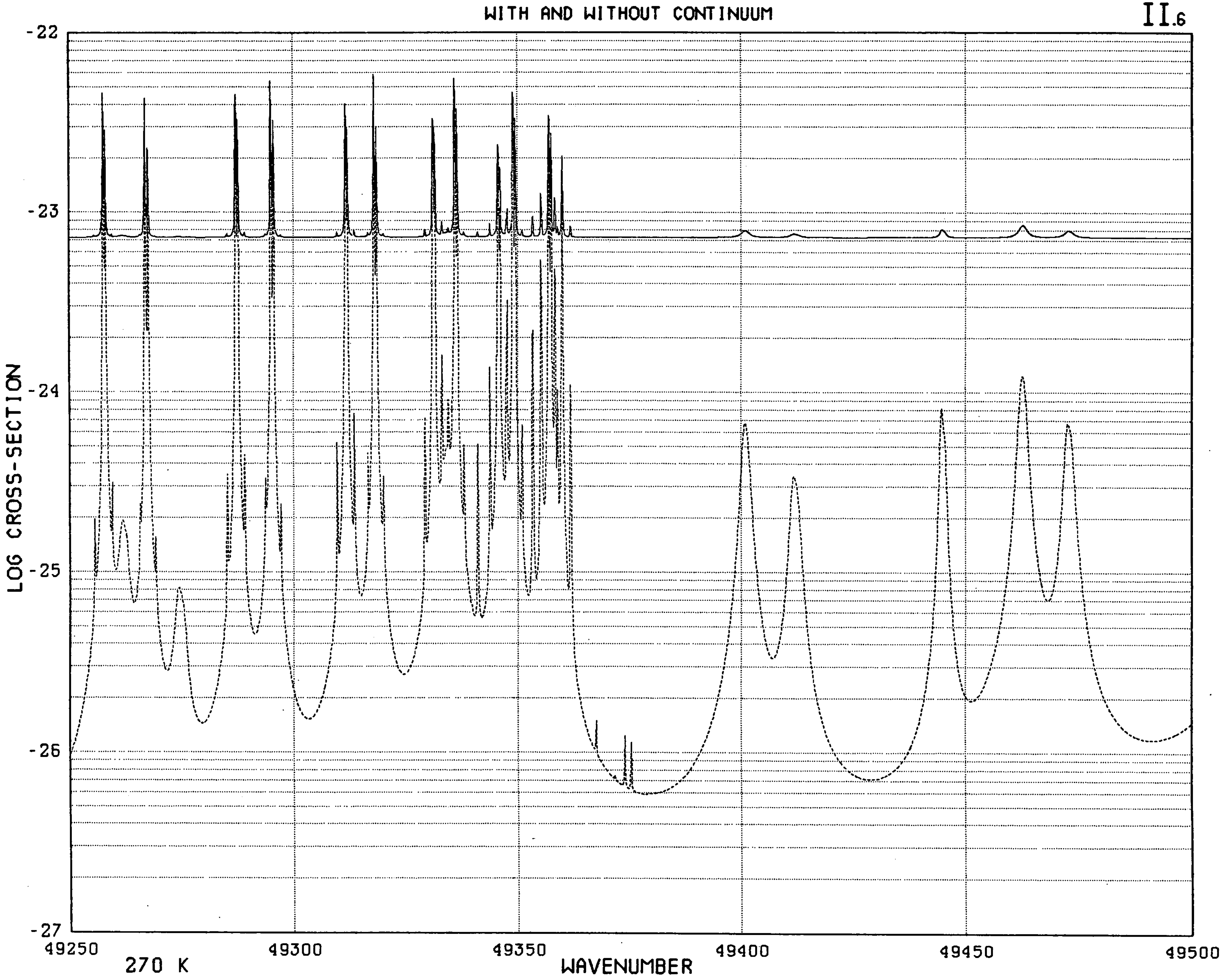

IDENTIFICATION
300K
0-0 BAND
P11 R13
P9 R11
P7 R9 P5 R7 P3 R5
R3 R1
P27 R29
1-0 BAND
P29
3-1 BAND
P23 R25
P21 R23
CROSS-SECTION
6
5
4
3
2
1.10^-23
0
49250
49300
49350
49400
49450
49500
WAVENUMBER

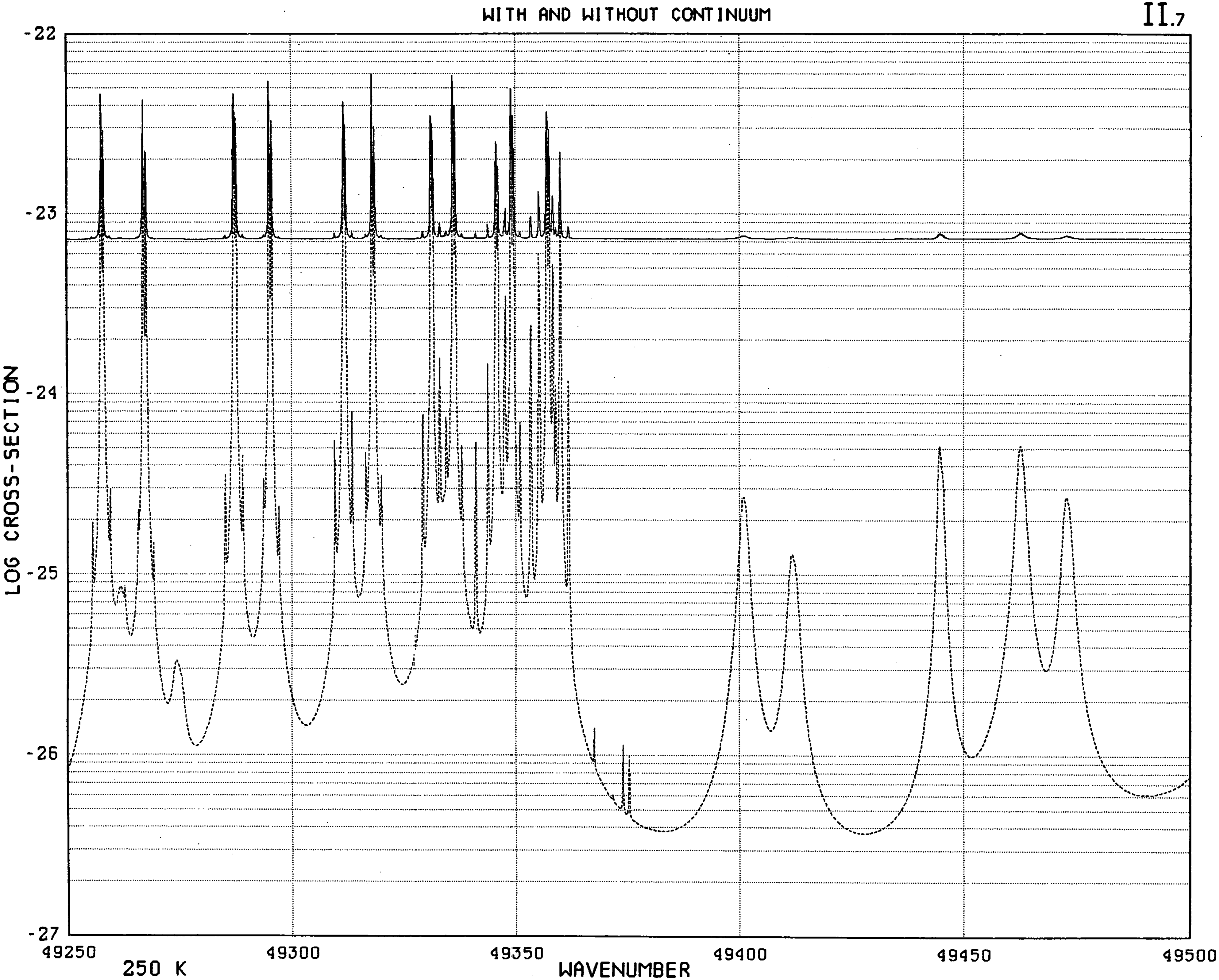

CROSS-SECTION
0-0 BAND
P11 R13
P9 R11
P7 R9
P5 R7 P3 R5
R3 R1
1-0 BAND
P29
3-1 BAND
P27 R29
P23 R25
P21 R23
0-0 BAND O.S.=2.8x10-10
L.W.=0.1cm-1
CONTINUUM=7.20x10-24cm2
(49250 cm-1)
LOG SIGMA(O2)
-22
-23
-24
49250
49300
49350
49400
49450
49500
300 K
WAVENUMBER

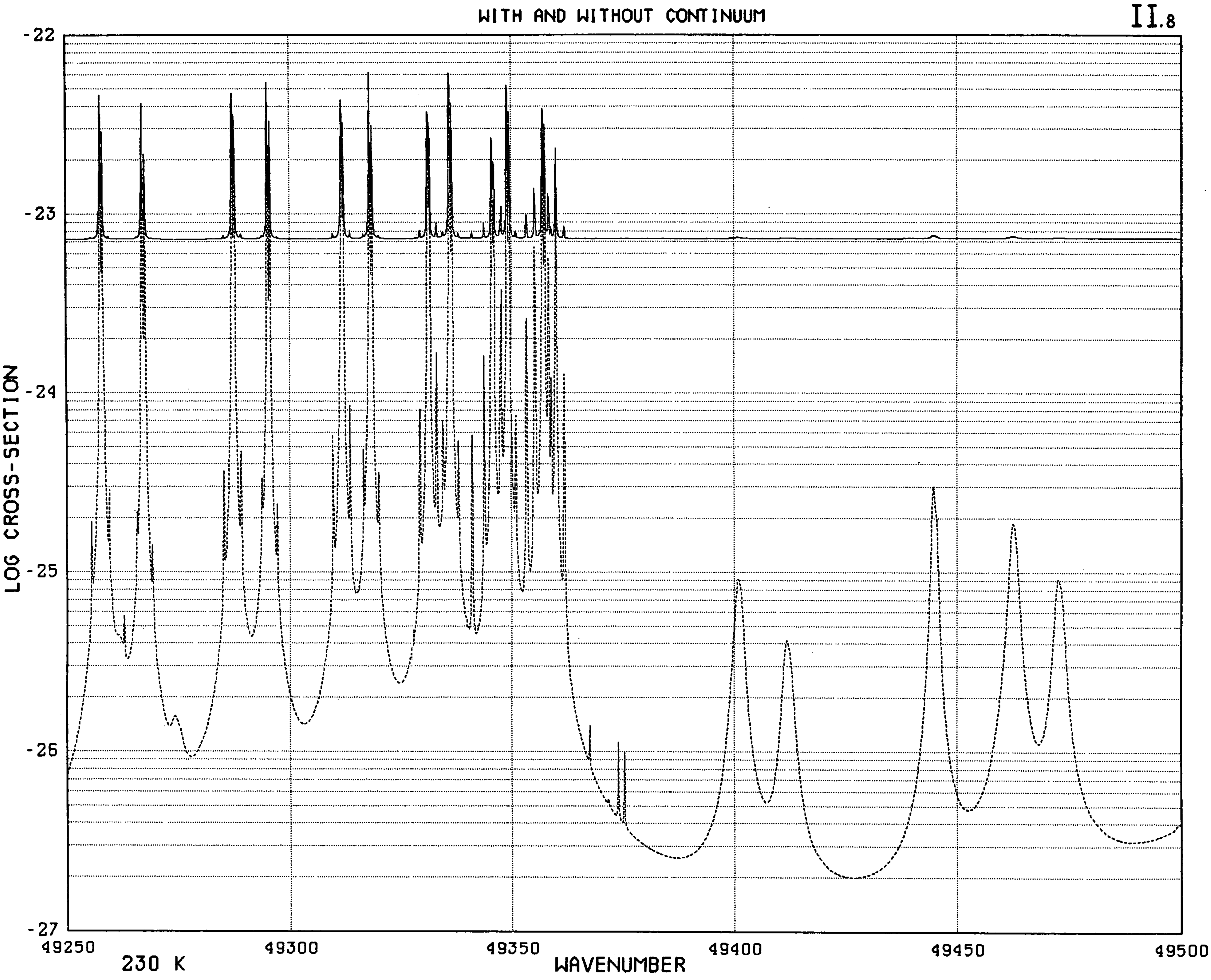

CONTINUUM-VARIATION 10% AND 20%
LOG CROSS-SECTION
-22
-23
-24
49250
49300
49350
49400
49450
49500
300 K
WAVENUMBER

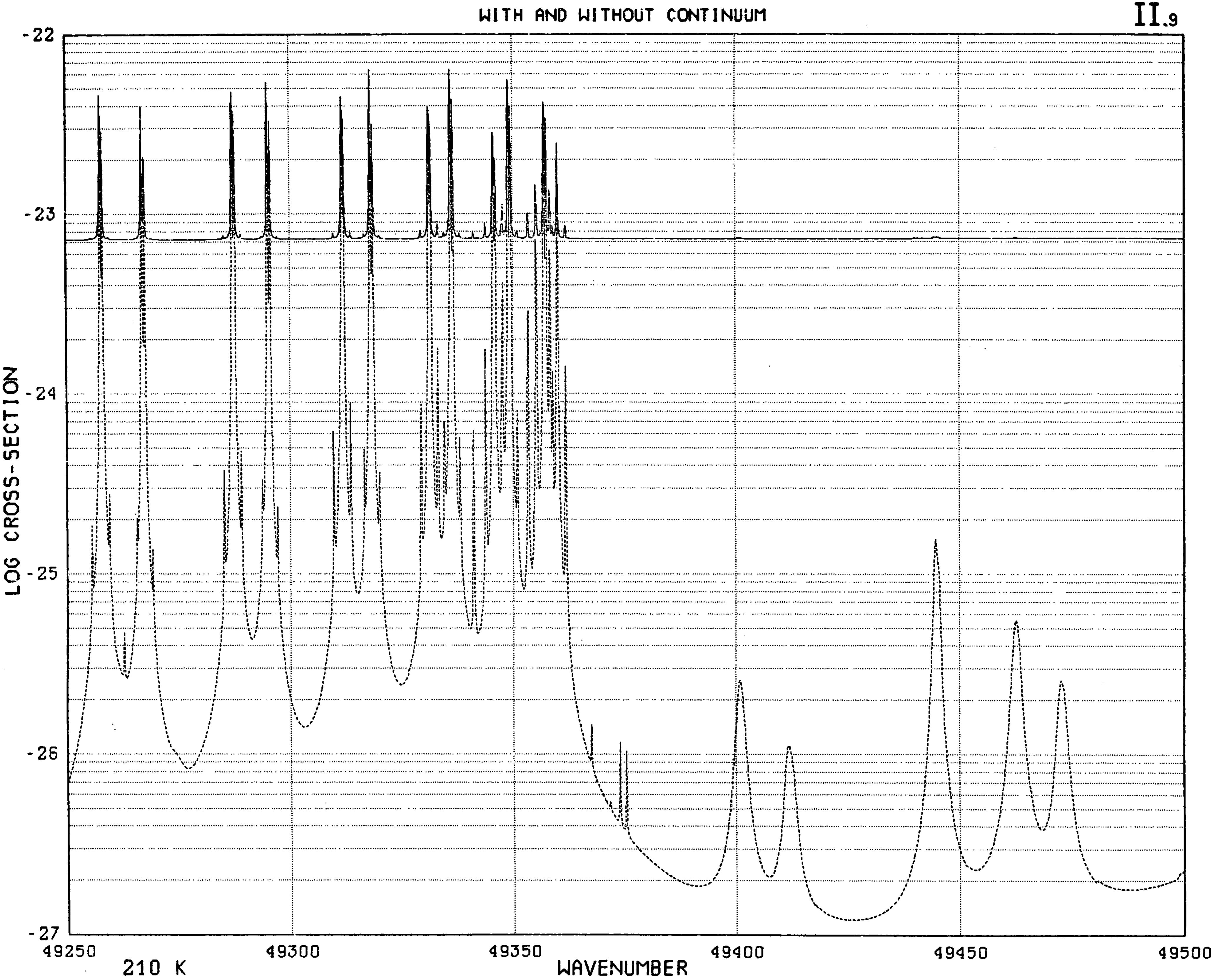

300 K - TEMPERATURE - 190 K
-22
-23
-24
LOG CROSS-SECTION
49250
49300
49350
49400
49450
49500
300-270-230-190 K
WAVENUMBER

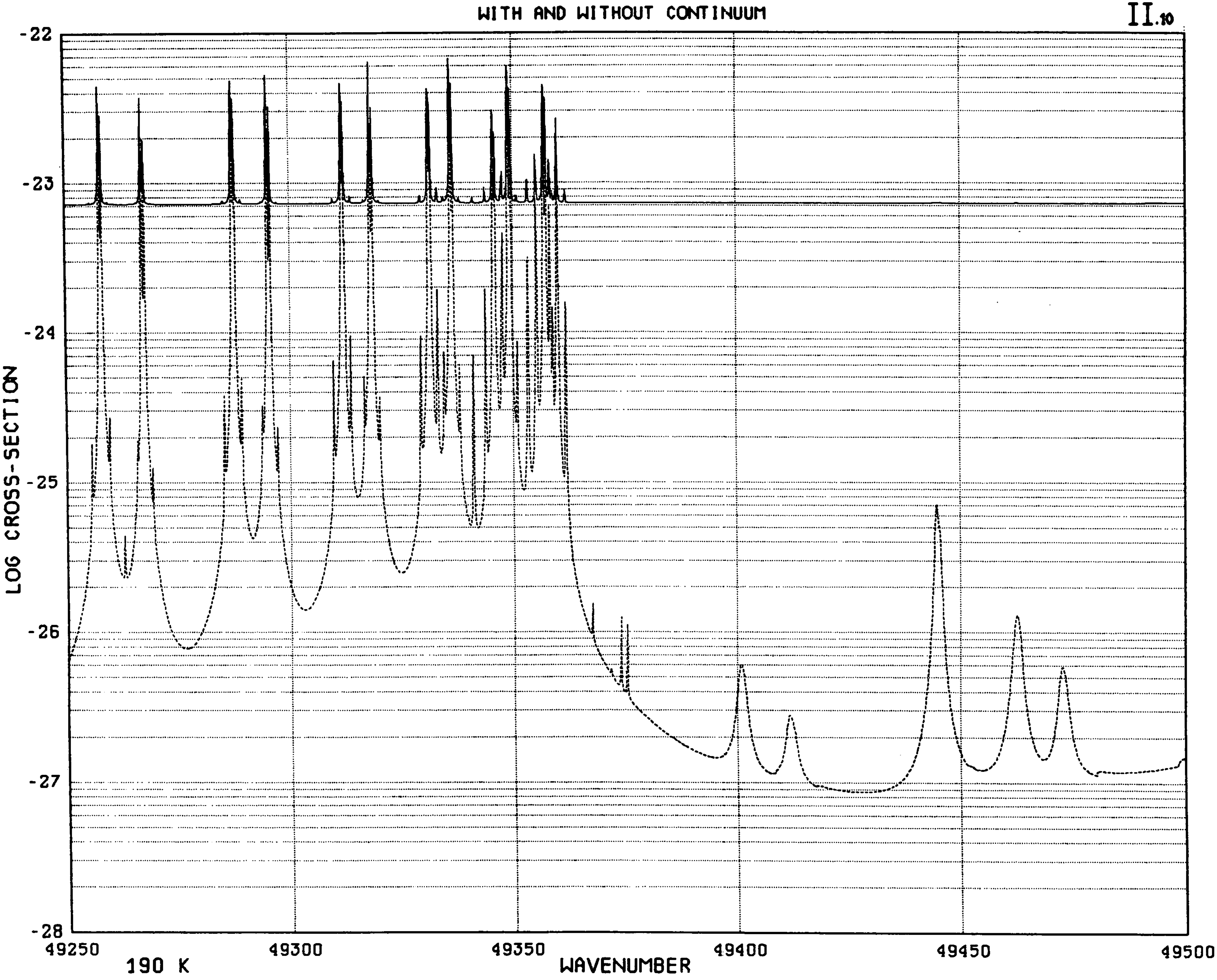

WITH AND WITHOUT CONTINUUM
II.5
LOG CROSS-SECTION
-22
-23
-24
-25
-26
49250
49300
49350
49400
49450
49500
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-22
-23
-24
-25
-26
-27
49250
49300
49350
49400
49450
49500
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
-26
-27
LOG CROSS-SECTION
49250
49300
49350
49400
49450
49500
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
-26
-27
LOG CROSS-SECTION
49250
49300
49350
49400
49450
49500
230 K
WAVENUMBER

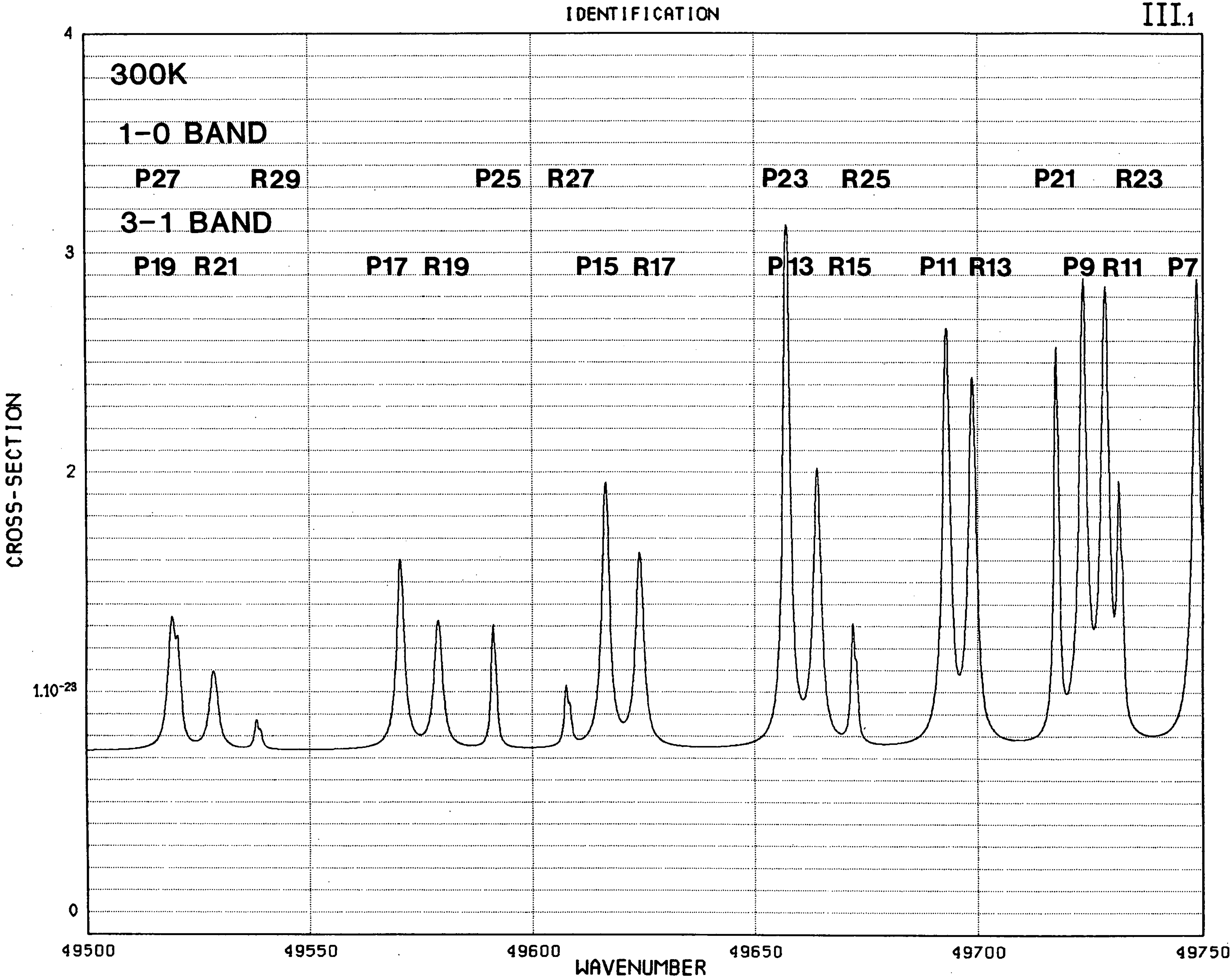

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-22
-23
-24
-25
-26
-27
49250
49300
49350
49400
49450
49500
210 K
WAVENUMBER

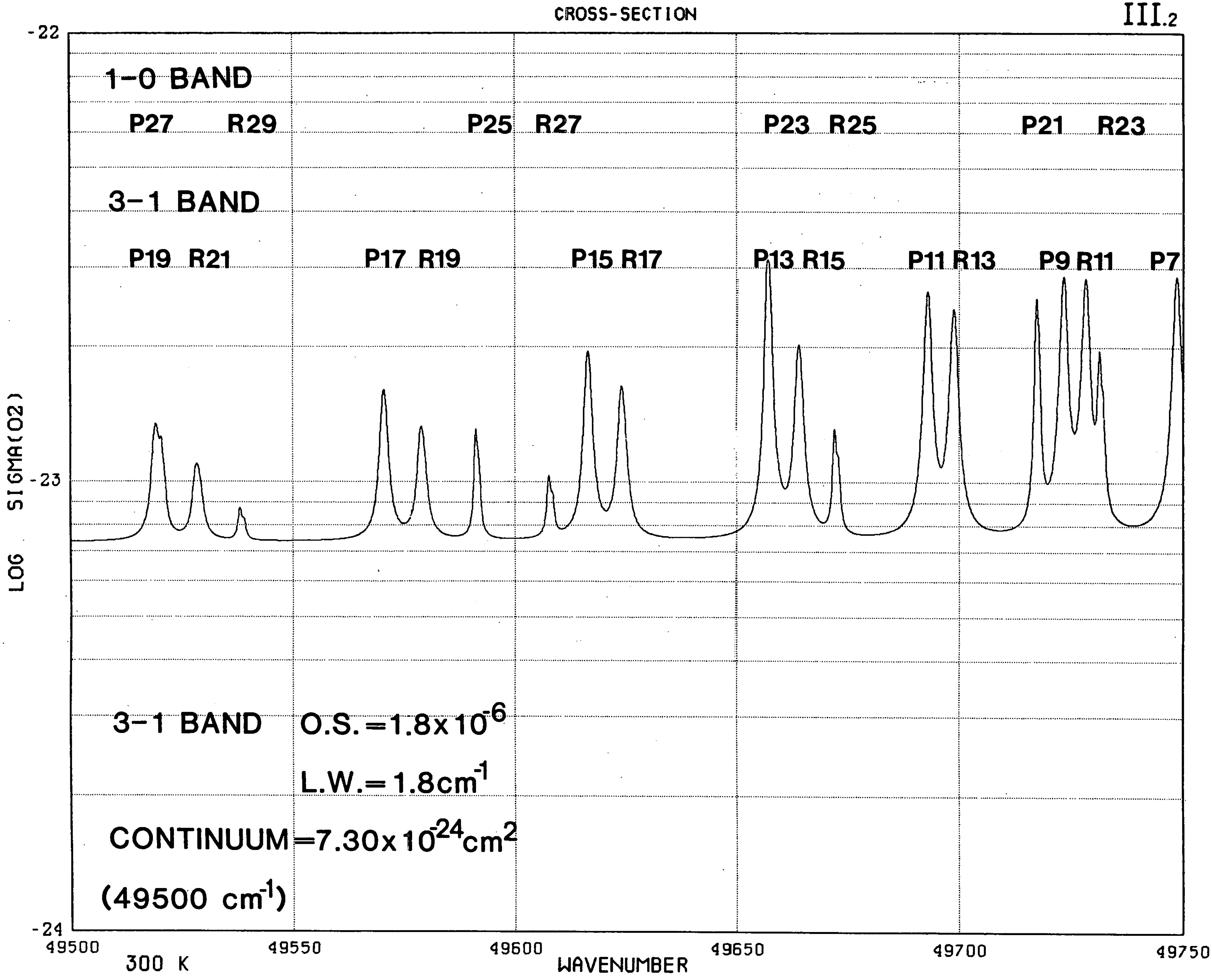


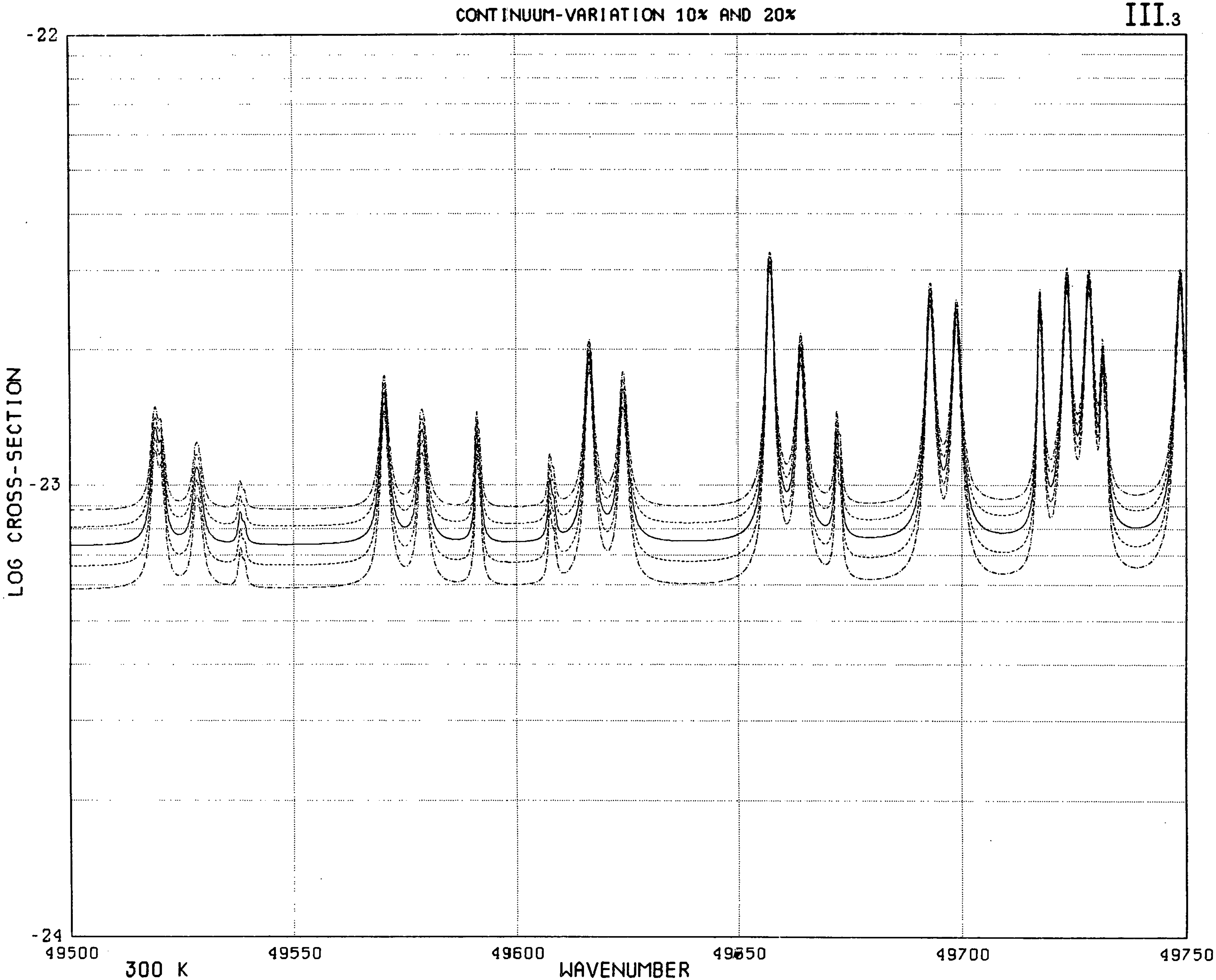
WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-22
-23
-24
-25
-26
-27
-28
49250
49300
49350
49400
49450
49500
190 K
WAVENUMBER

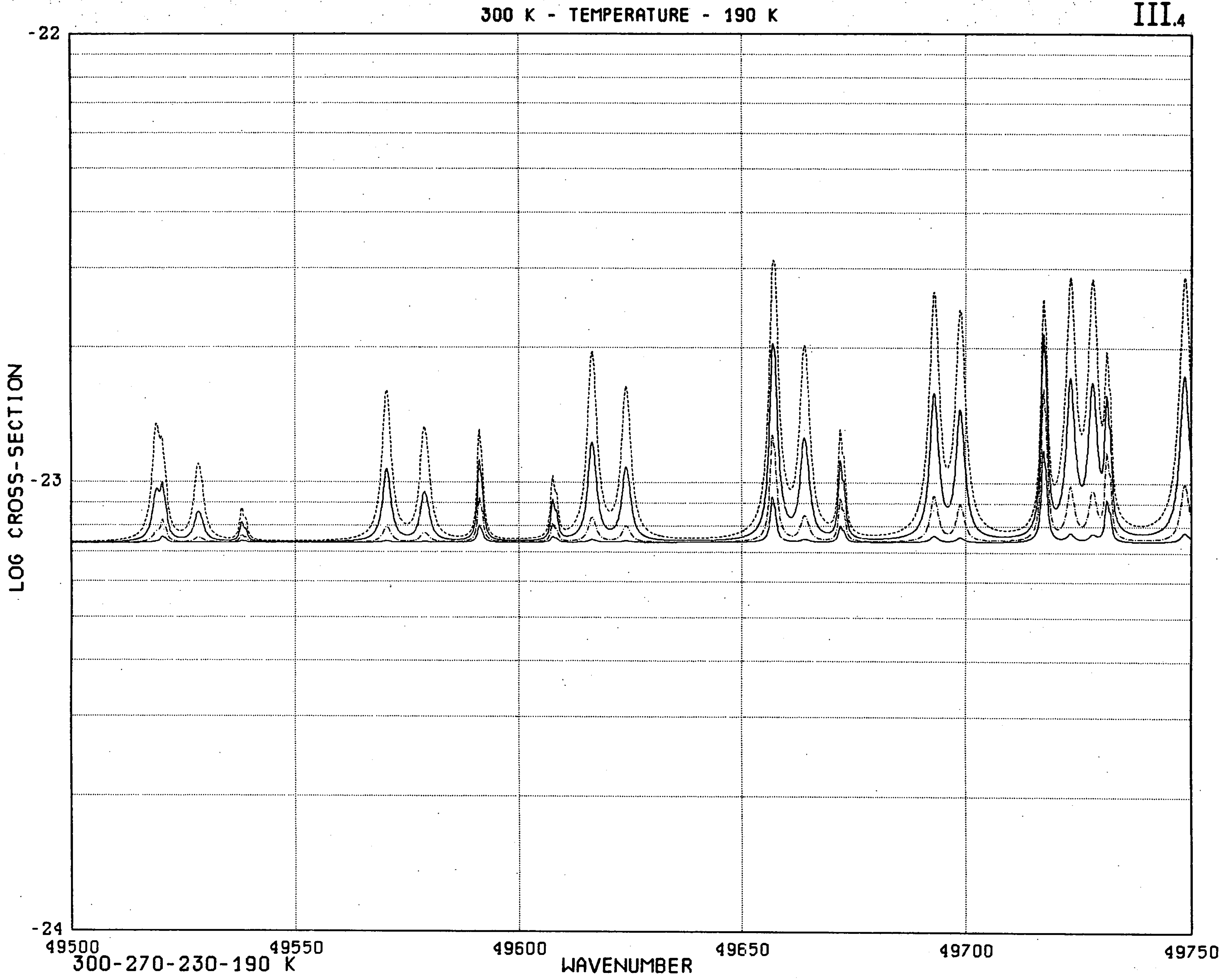
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
49500 - 49750 cm^{-1}

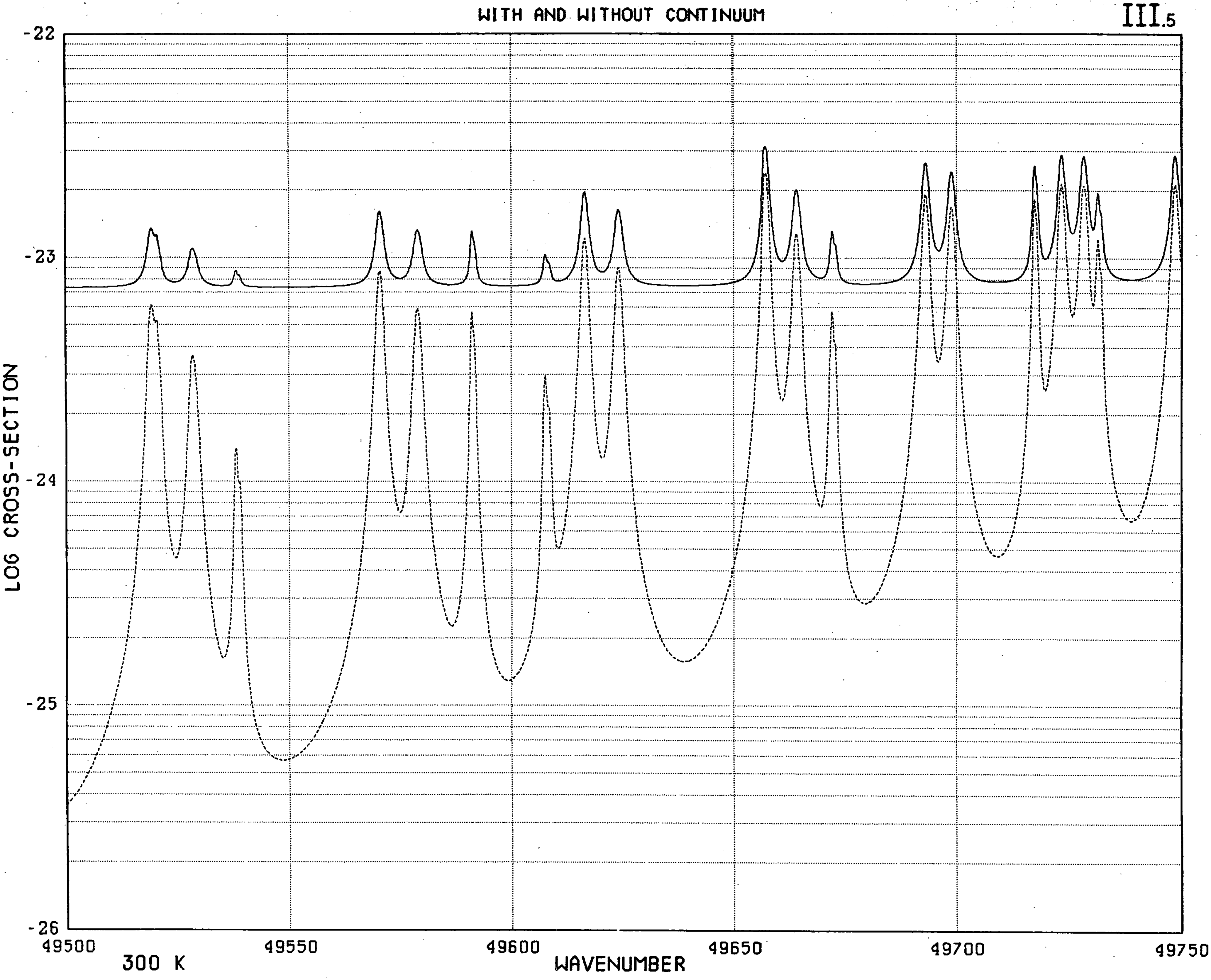
v	λ	band	v	λ	band
49500			49693.3	2012.34	3-1 P11
49518.9	2019.43	3-1 P19	49698.6	2012.13	3-1 R13
49519.0	2019.43	3-1 P19	49698.7	2012.13	3-1 R13
49519.6	2019.40	3-1 P19	49699.3	2012.10	3-1 R13
49520.4	2019.37	1-0 P27	49700		
49520.5	2019.37	1-0 P27	49717.3	2011.37	1-0 P21
49521.1	2019.34	1-0 P27	49717.3	2011.37	1-0 P21
49528.2	2019.05	3-1 R21	49717.9	2011.35	1-0 P21
49528.4	2019.04	3-1 R21	49723.2	2011.13	3-1 P 9
49529.1	2019.01	3-1 R21	49723.3	2011.13	3-1 P 9
49537.9	2018.65	1-0 R29	49723.7	2011.11	3-1 P 9
49538.2	2018.65	1-0 R29	49728.2	2010.93	3-1 R11
49539.0	2018.61	1-0 R29	49728.2	2010.93	3-1 R11
49550			49728.7	2010.91	3-1 R11
49570.2	2017.34	3-1 P17	49731.3	2010.80	1-0 R23
49570.3	2017.34	3-1 P17	49731.5	2010.80	1-0 R23
49570.8	2017.32	3-1 P17	49732.2	2010.77	1-0 R23
49578.6	2017.00	3-1 R19	49748.5	2010.11	3-1 P 7
49578.8	2016.99	3-1 R19	49748.6	2010.11	3-1 P 7
49579.5	2016.96	3-1 R19	49748.9	2010.09	3-1 P 7
49591.1	2016.49	1-0 P25			
49591.2	2016.49	1-0 P25			
49591.8	2016.46	1-0 P25			
49600					
49607.5	2015.82	1-0 R27			
49607.7	2015.82	1-0 R27			
49608.5	2015.78	1-0 R27			
49616.3	2015.47	3-1 P15			
49616.3	2015.47	3-1 P15			
49616.9	2015.44	3-1 P15			
49623.9	2015.16	3-1 R17			
49624.0	2015.15	3-1 R17			
49624.6	2015.13	3-1 R17			
49650					
49656.7	2013.82	1-0 P23			
49656.8	2013.82	1-0 P23			
49657.2	2013.81	3-1 P13			
49657.2	2013.81	3-1 P13			
49657.4	2013.80	1-0 P23			
49663.9	2013.54	3-1 R15			
49663.9	2013.53	3-1 R15			
49664.5	2013.51	3-1 R15			
49672.0	2013.21	1-0 R25			
49672.1	2013.20	1-0 R25			
49672.9	2013.17	1-0 R25			
49692.8	2012.36	3-1 P11			
49692.9	2012.36	3-1 P11			


IDENTIFICATION
300K
1-0 BAND
P27 R29 P25 R27 P23 R25 P21 R23
3-1 BAND
P19 R21 P17 R19 P15 R17 P13 R15 P11 R13 P9 R11 P7
CROSS-SECTION
4
3
2
1.10-23
0
49500
49550
49600
49650
49700
49750
WAVENUMBER

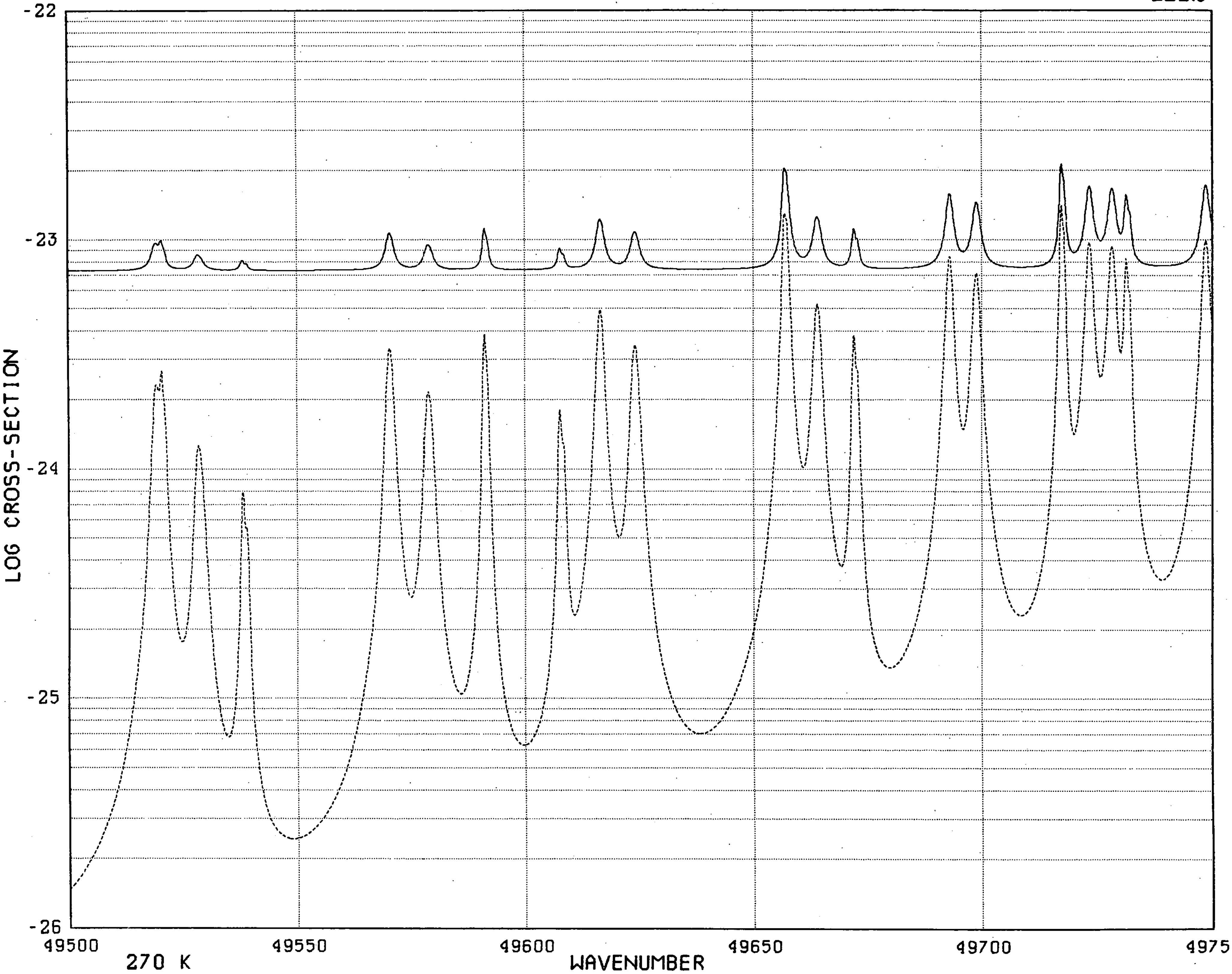

CROSS-SECTION
1-0 BAND
P27 R29 P25 R27 P23 R25 P21 R23
3-1 BAND
P19 R21 P17 R19 P15 R17 P13 R15 P11 R13 P9 R11 P7
-22
-23
-24
LOG SIGMA(O2)
3-1 BAND O.S.=1.8x10^-6
L.W.=1.8cm^-1
CONTINUUM=7.30x10^-24 cm^2
(49500 cm^-1)
49500
49550
49600
49650
49700
49750
300 K
WAVENUMBER


CONTINUUM-VARIATION 10% AND 20%
-22
-23
-24
LOG CROSS-SECTION
49500
49550
49600
49650
49700
49750
300 K
WAVENUMBER

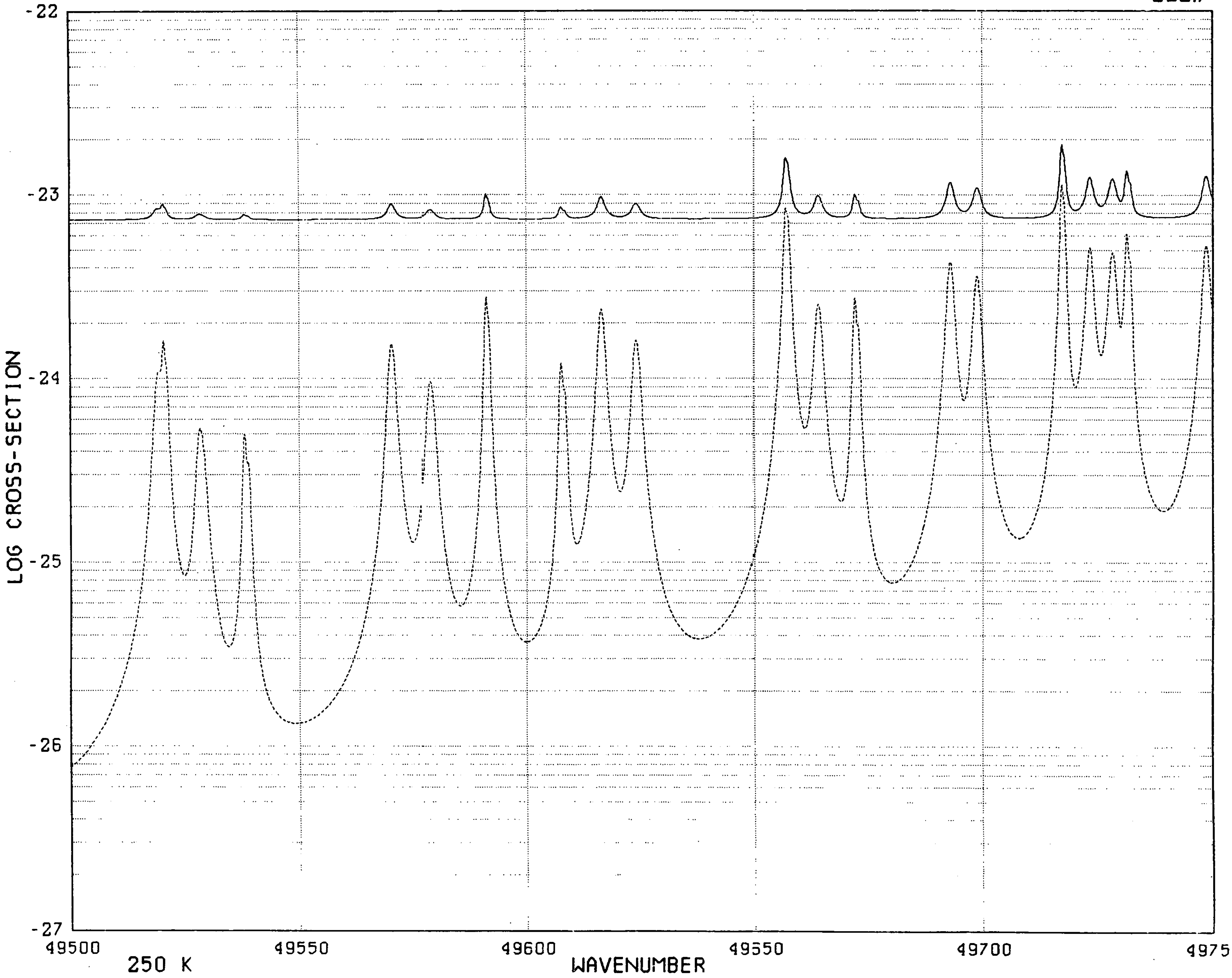

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-22
-23
-24
49500
49550
49600
49650
49700
49750
300-270-230-190 K
WAVENUMBER

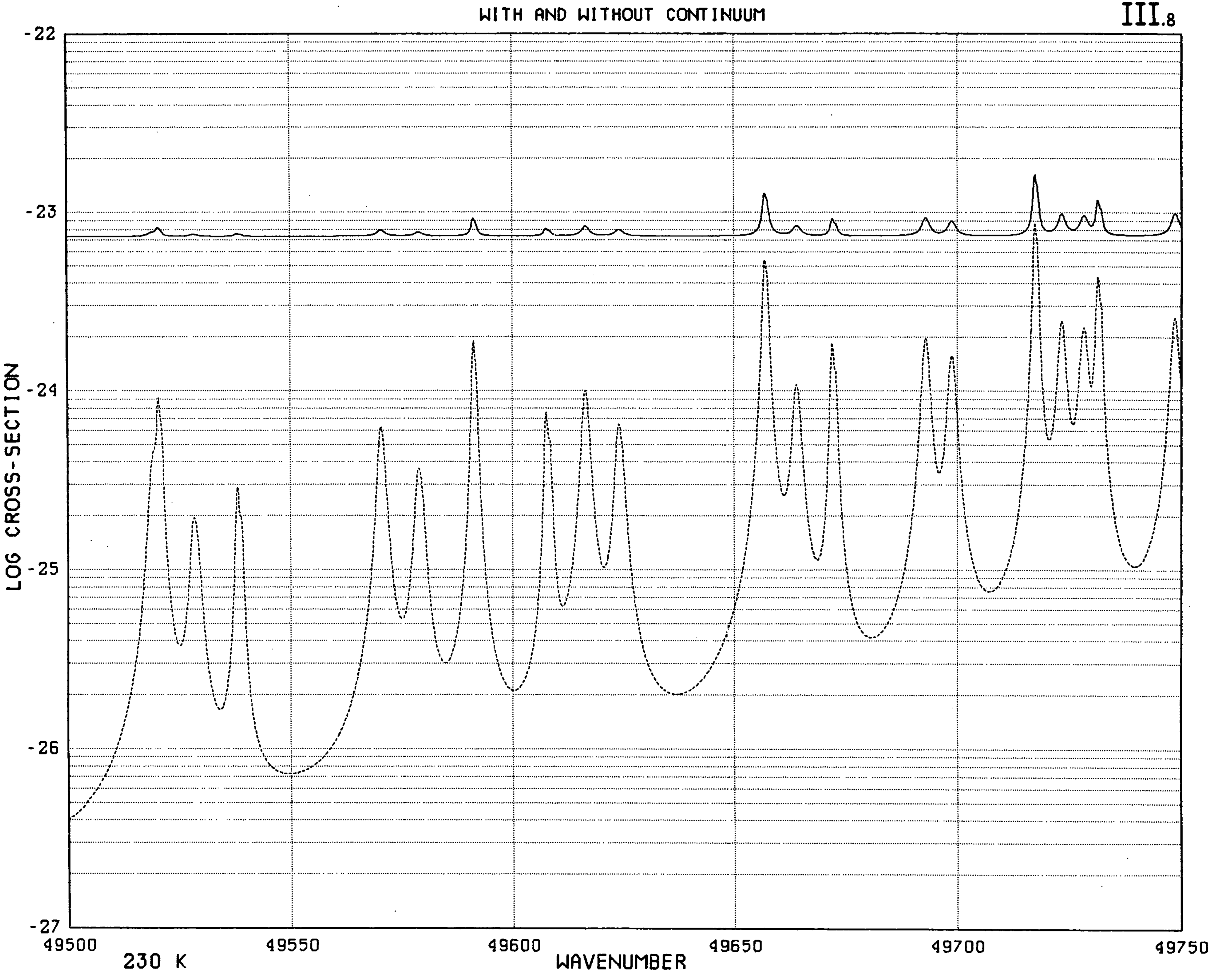

WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
-26
LOG CROSS-SECTION
49500
49550
49600
49650
49700
49750
300 K
WAVENUMBER

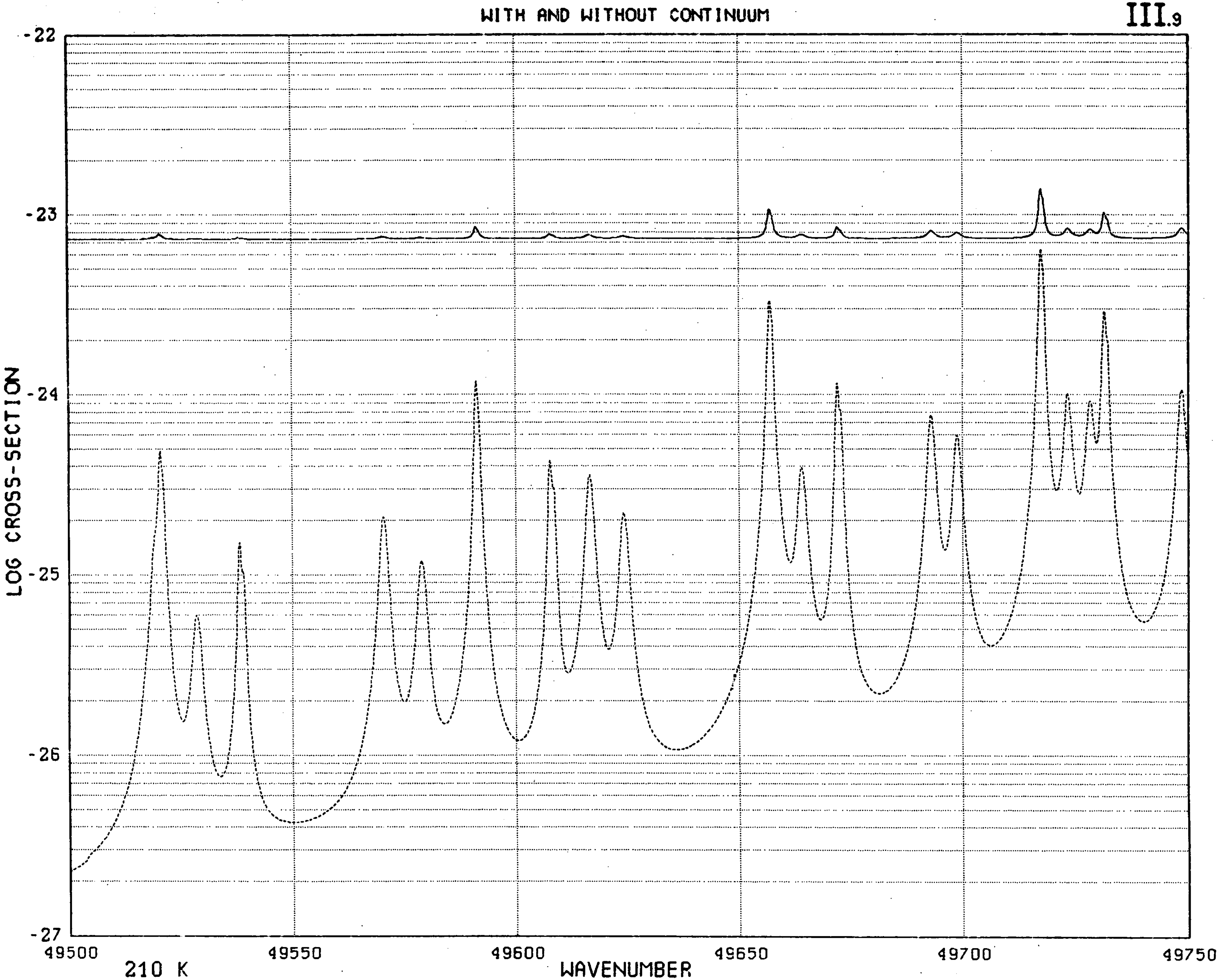
WITH AND WITHOUT CONTINUUM

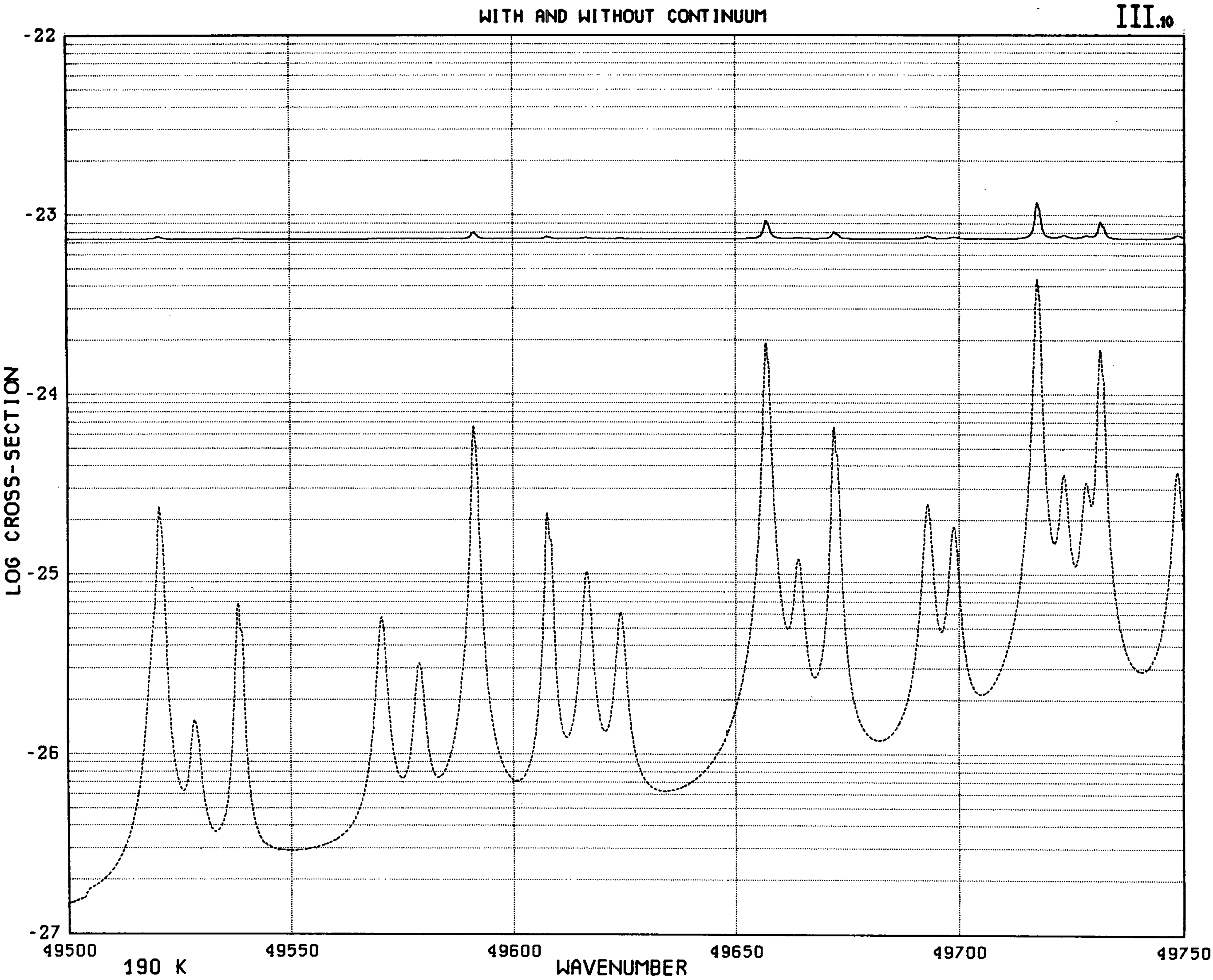


WITH AND WITHOUT CONTINUUM



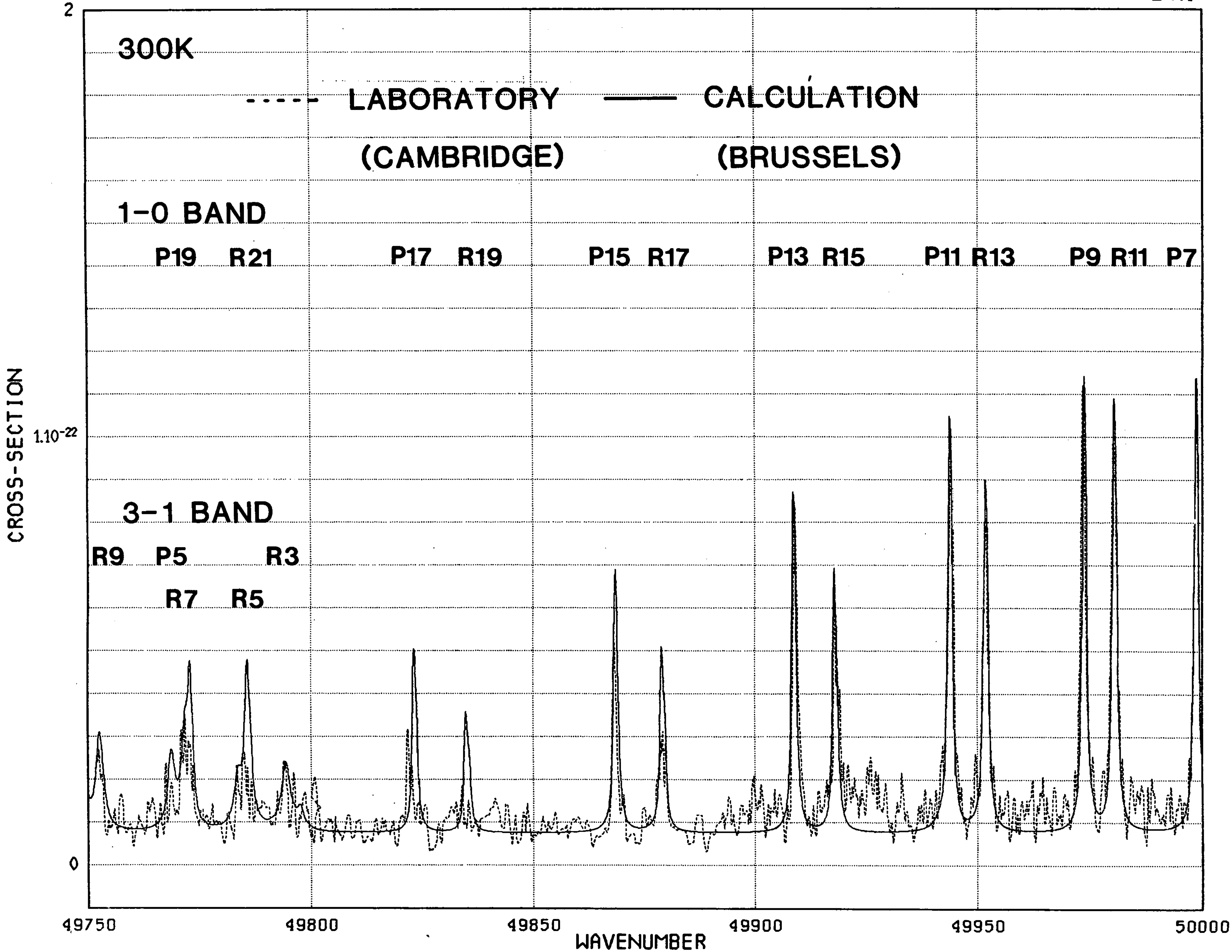

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-22
-23
-24
-25
-26
-27
49500
49550
49600
49650
49700
49750
230 K
WAVENUMBER

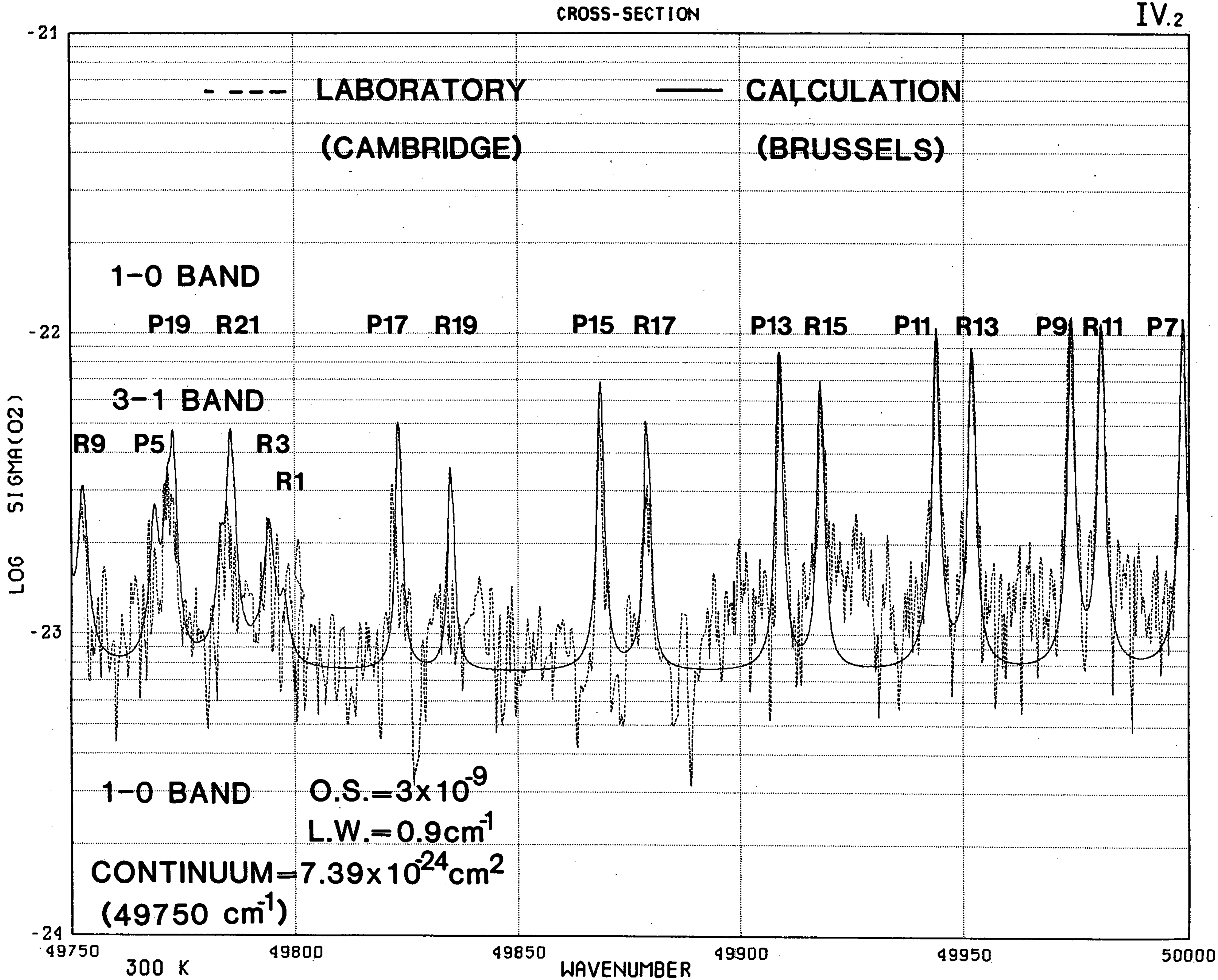

WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
-26
-27
LOG CROSS-SECTION
49500
49550
49600
49650
49700
49750
210 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
-26
-27
LOG CROSS-SECTION
49500
49550
49600
49650
49700
49750
190 K
WAVENUMBER

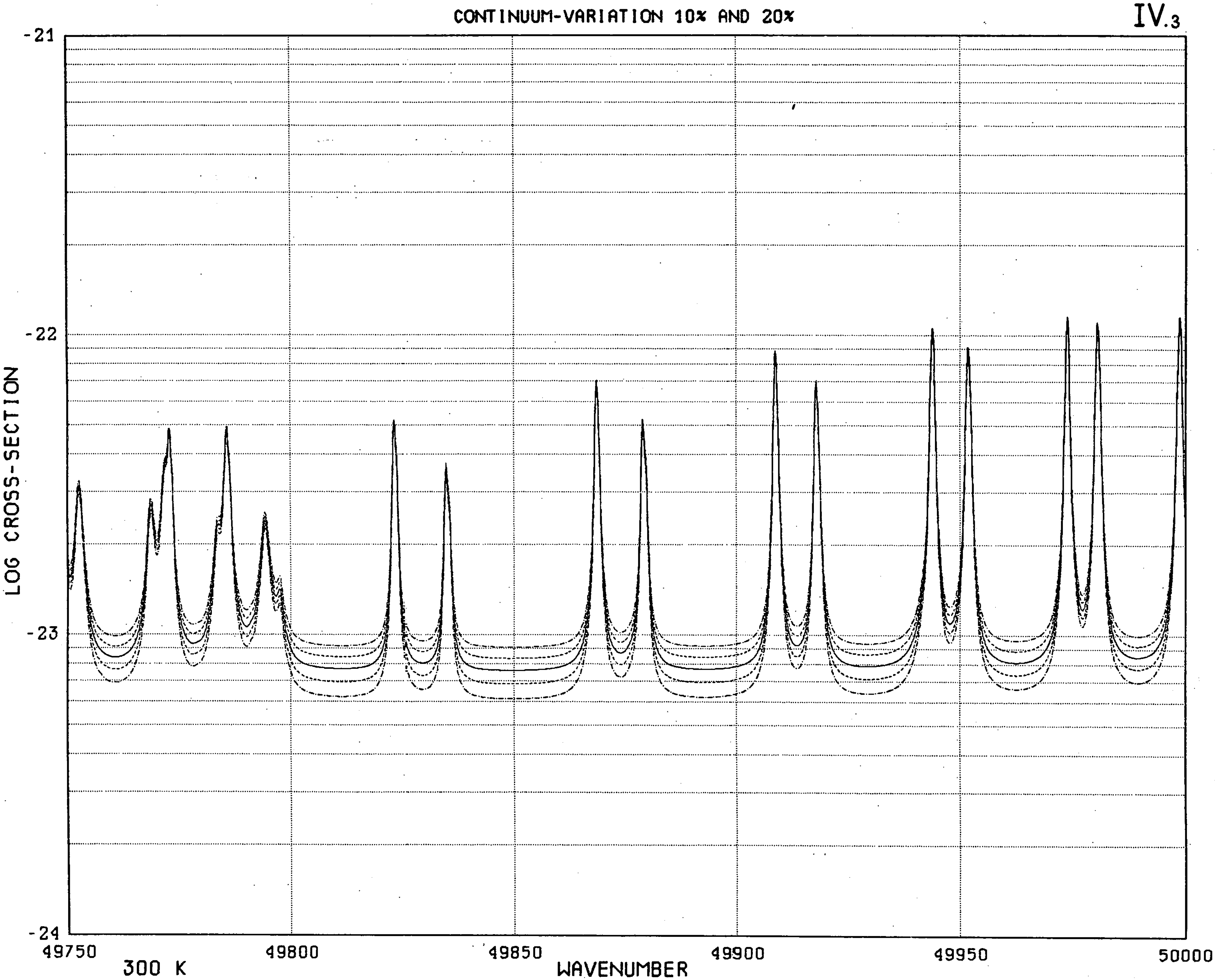
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
49750 - 50000 cm^{-1}

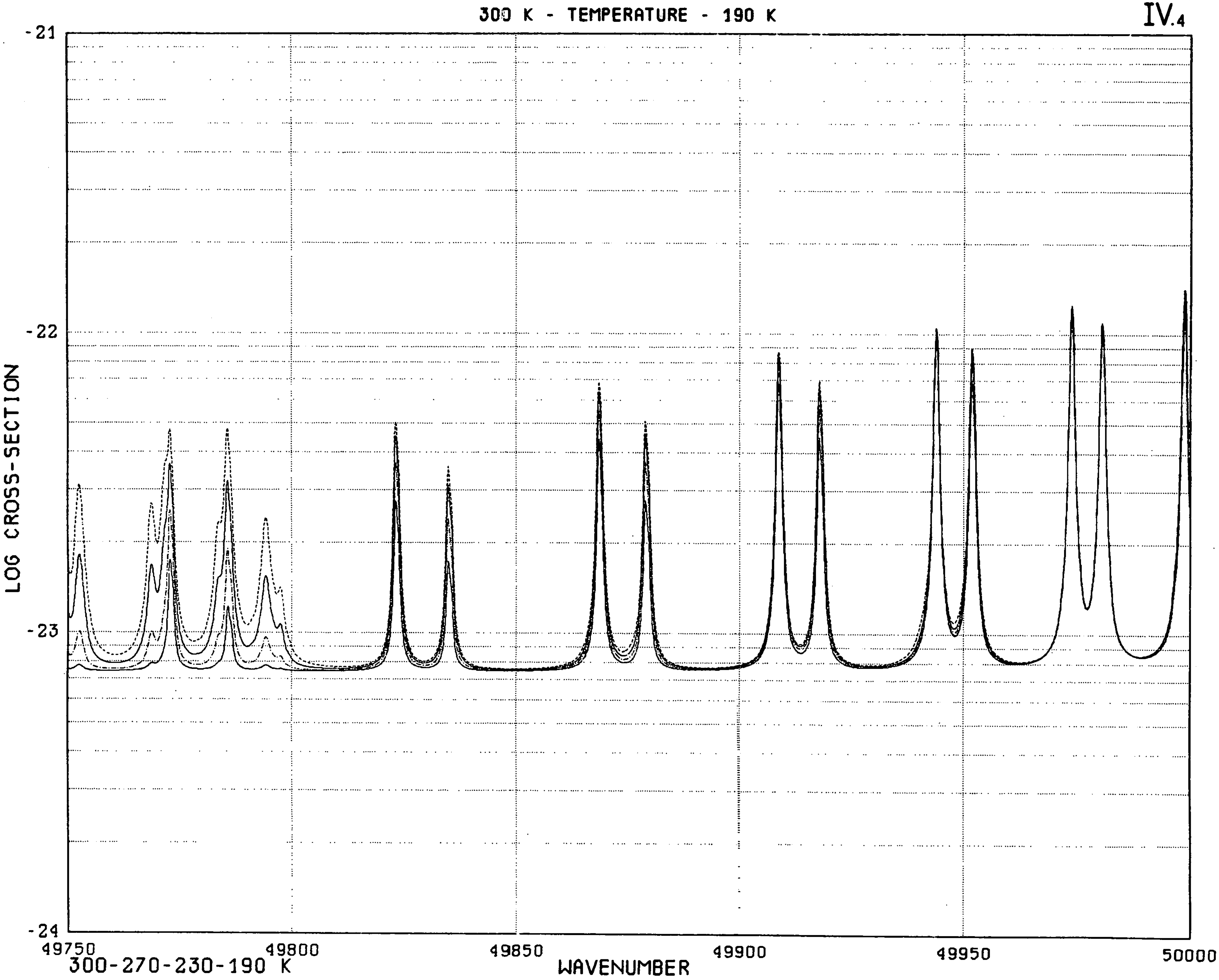
v	λ	band	v	λ	band
49750					
49752.5	2009.95	3-1 R 9	49878.9	2004.86	1-0 R17
49752.5	2009.95	3-1 R 9	49878.9	2004.85	1-0 R17
49753.0	2009.93	3-1 R 9	49879.6	2004.83	1-0 R17
49768.5	2009.30	3-1 P 5	49900		
49768.6	2009.30	3-1 P 5	49908.6	2003.66	1-0 P13
49768.9	2009.29	3-1 P 5	49908.7	2003.66	1-0 P13
49771.6	2009.18	3-1 R 7	49909.1	2003.64	1-0 P13
49771.6	2009.18	3-1 R 7	49917.8	2003.29	1-0 R15
49772.1	2009.16	3-1 R 7	49917.9	2003.29	1-0 R15
49772.8	2009.13	1-0 P19	49918.5	2003.27	1-0 R15
49772.8	2009.13	1-0 P19	49941.4	2002.35	4-1 P25
49773.4	2009.11	1-0 P19	49941.8	2002.33	4-1 P25
49783.3	2008.71	3-1 P 3	49942.5	2002.30	4-1 P25
49783.4	2008.70	3-1 P 3	49943.7	2002.25	1-0 P11
49783.8	2008.69	3-1 P 3	49943.8	2002.25	1-0 P11
49785.4	2008.62	3-1 R 5	49944.2	2002.24	1-0 P11
49785.5	2008.62	3-1 R 5	49949.4	2002.02	4-1 R27
49785.6	2008.61	1-0 R21	49950		
49785.7	2008.61	1-0 R21	49950.0	2002.00	4-1 R27
49785.9	2008.60	3-1 R 5	49951.0	2001.96	4-1 R27
49788.3	2008.50	4-1 P29	49951.7	2001.93	1-0 R13
49788.8	2008.48	4-1 P29	49951.7	2001.93	1-0 R13
49789.7	2008.45	4-1 P29	49952.3	2001.91	1-0 R13
49793.0	2008.32	3-1 P 1	49973.7	2001.05	1-0 P 9
49794.1	2008.27	3-1 R 3	49973.8	2001.05	1-0 P 9
49794.2	2008.27	3-1 R 3	49974.2	2001.03	1-0 P 9
49794.6	2008.25	3-1 R 3	49980.4	2000.78	1-0 R11
49795.9	2008.20	3-1 Q 1	49980.5	2000.78	1-0 R11
49797.5	2008.13	3-1 R 1	49981.0	2000.76	1-0 R11
49797.6	2008.13	3-1 R 1	49998.6	2000.06	1-0 P 7
49800			49998.7	2000.05	1-0 P 7
49823.2	2007.10	1-0 P17	49999.0	2000.04	1-0 P 7
49823.2	2007.10	1-0 P17			
49823.7	2007.08	1-0 P17			
49834.8	2006.63	1-0 R19			
49834.9	2006.63	1-0 R19			
49835.5	2006.60	1-0 R19			
49850					
49867.5	2005.31	4-1 P27			
49868.0	2005.29	4-1 P27			
49868.4	2005.28	1-0 P15			
49868.5	2005.27	1-0 P15			
49868.8	2005.26	4-1 P27			
49876.0	2004.97	4-1 R29			
49876.7	2004.94	4-1 R29			
49877.7	2004.90	4-1 R29			

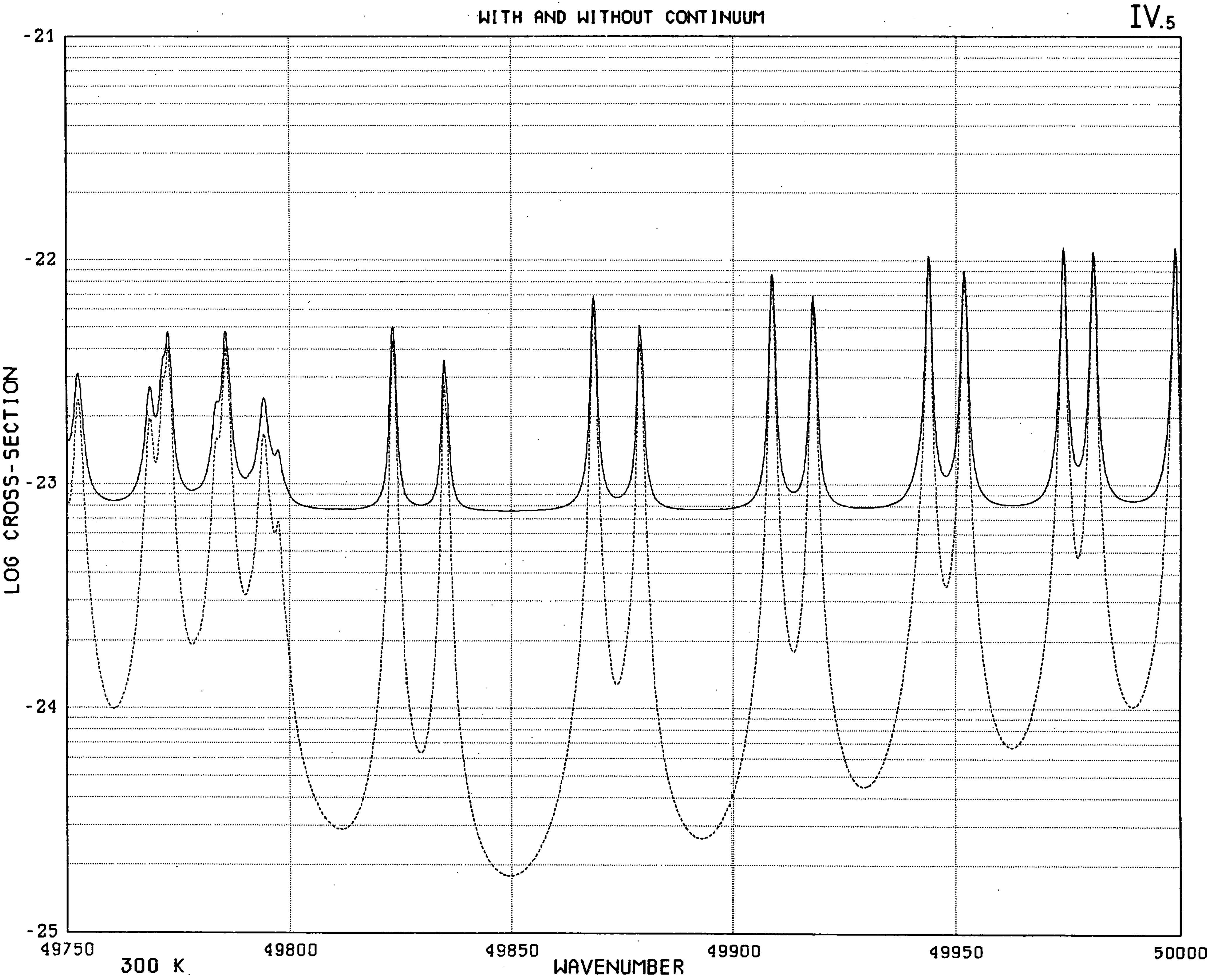

300K
LABORATORY (CAMBRIDGE)
CALCULATION (BRUSSELS)
1-0 BAND
P19 R21 P17 R19 P15 R17 P13 R15 P11 R13 P9 R11 P7
3-1 BAND
R9 P5 R3
R7 R5
CROSS-SECTION
2
1.10^{-22}
0
49750 49800 49850 49900 49950 50000
WAVENUMBER

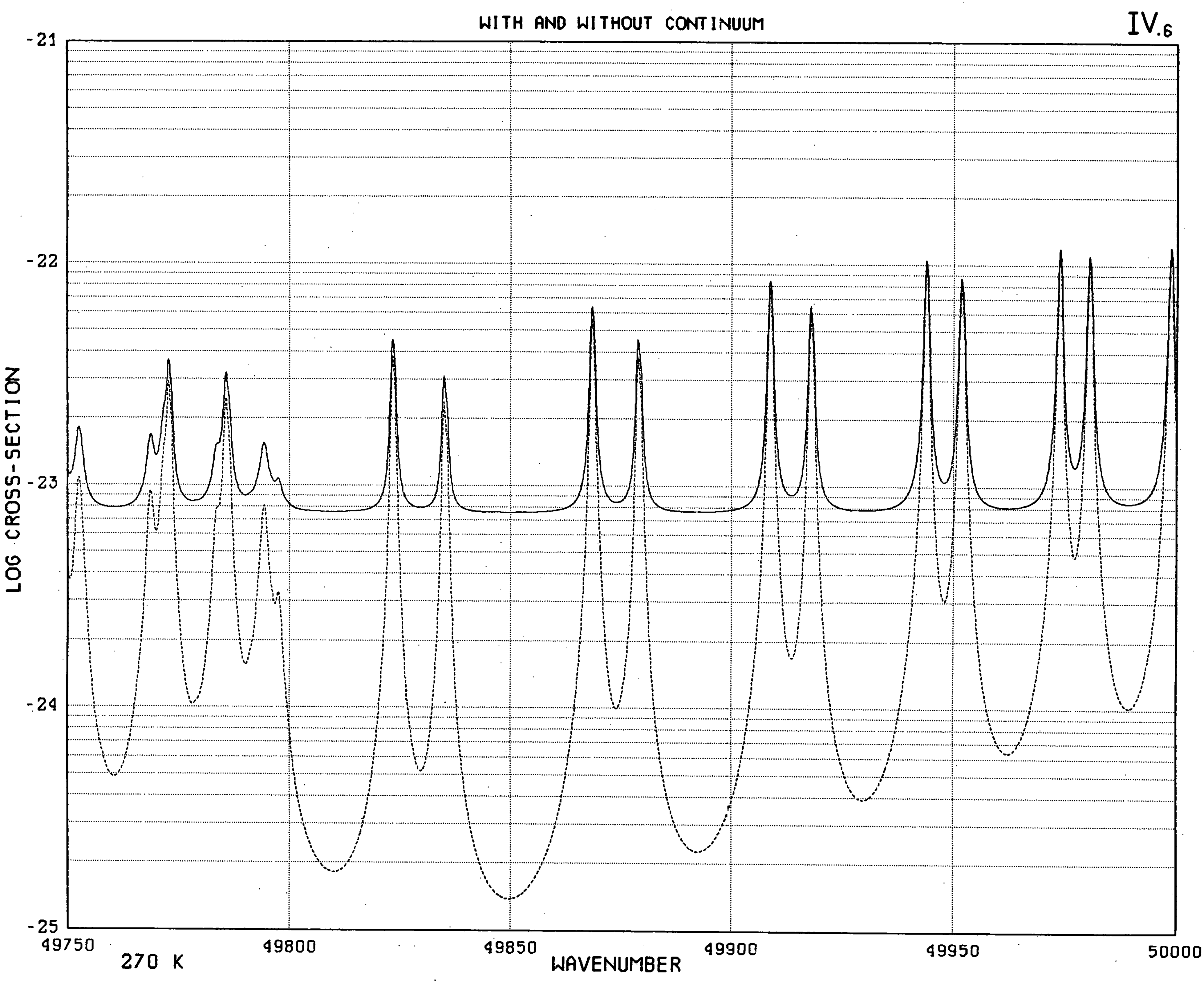

CROSS-SECTION
LABORATORY (CAMBRIDGE)
CALCULATION (BRUSSELS)
1-0 BAND
P19 R21 P17 R19 P15 R17 P13 R15 P11 R13 P9 R11 P7
3-1 BAND
R9 P5 R3 R1
1-0 BAND O.S.=3x10^-9
L.W.=0.9cm^-1
CONTINUUM=7.39x10^-24 cm^2
(49750 cm^-1)
LOG SIGMA(O2)
-21
-22
-23
-24
49750 49800 49850 49900 49950 50000
300 K
WAVENUMBER

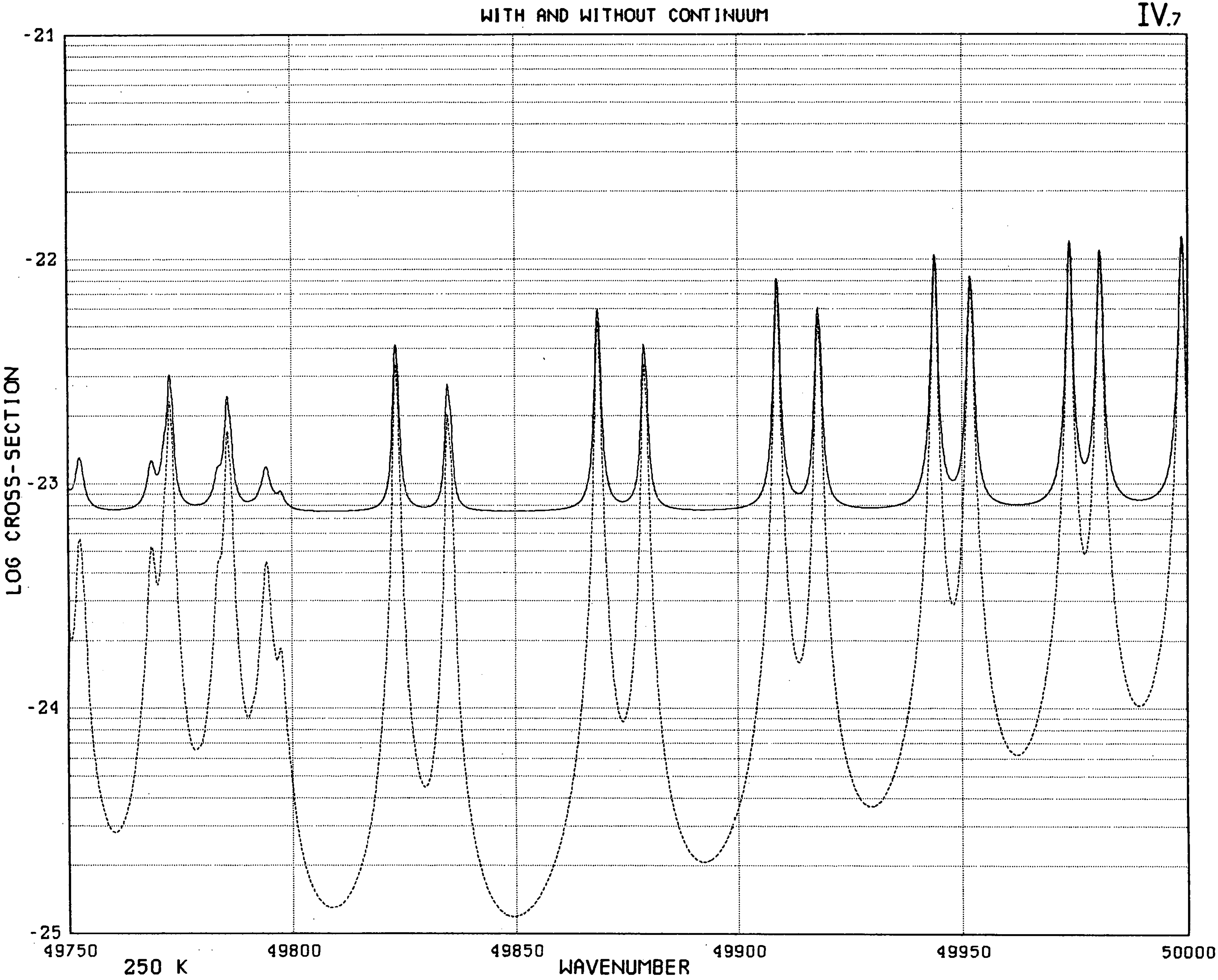
IV.3

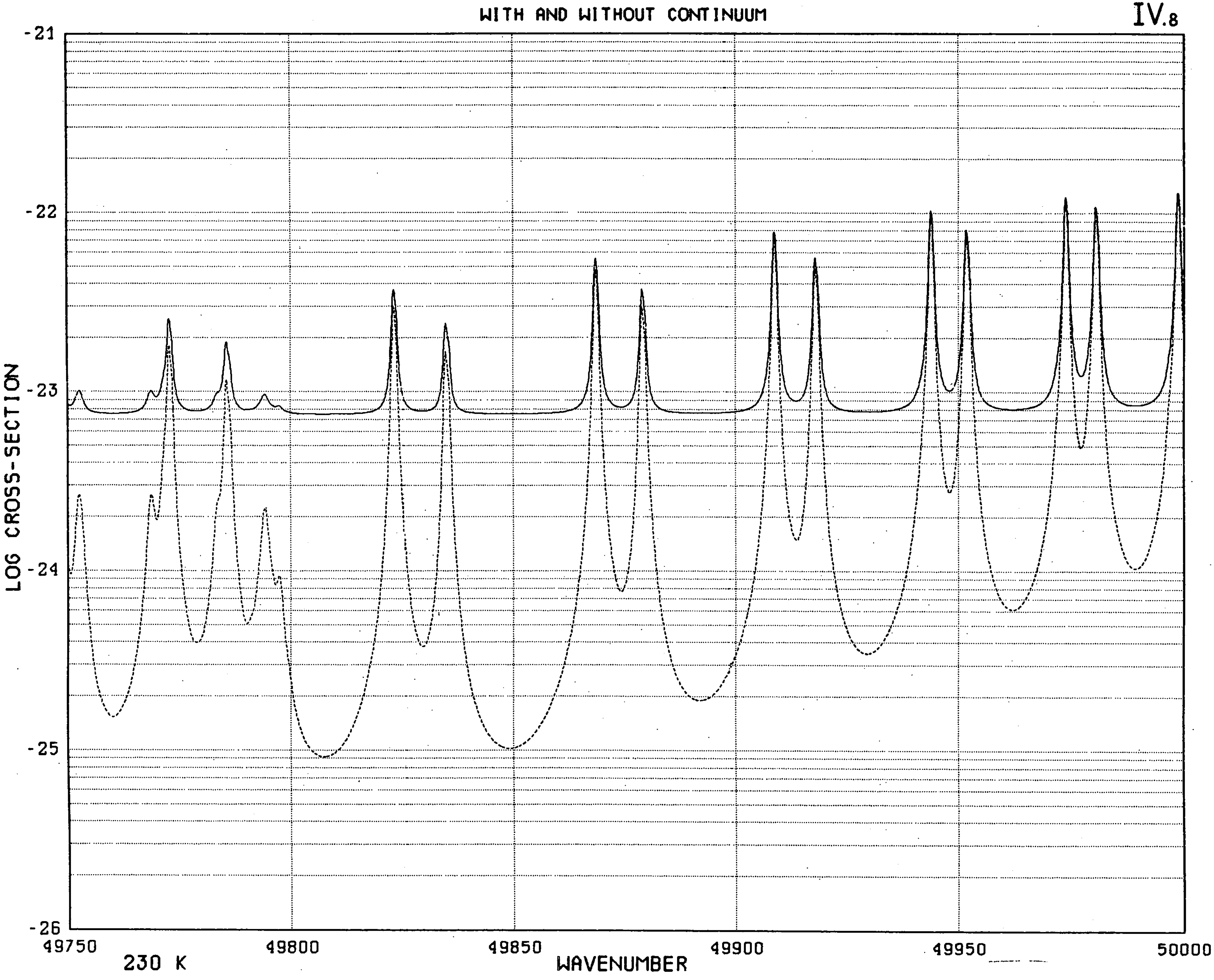

CONTINUUM-VARIATION 10% AND 20%
LOG CROSS-SECTION
-21
-22
-23
-24
49750
49800
49850
49900
49950
50000
300 K
WAVENUMBER

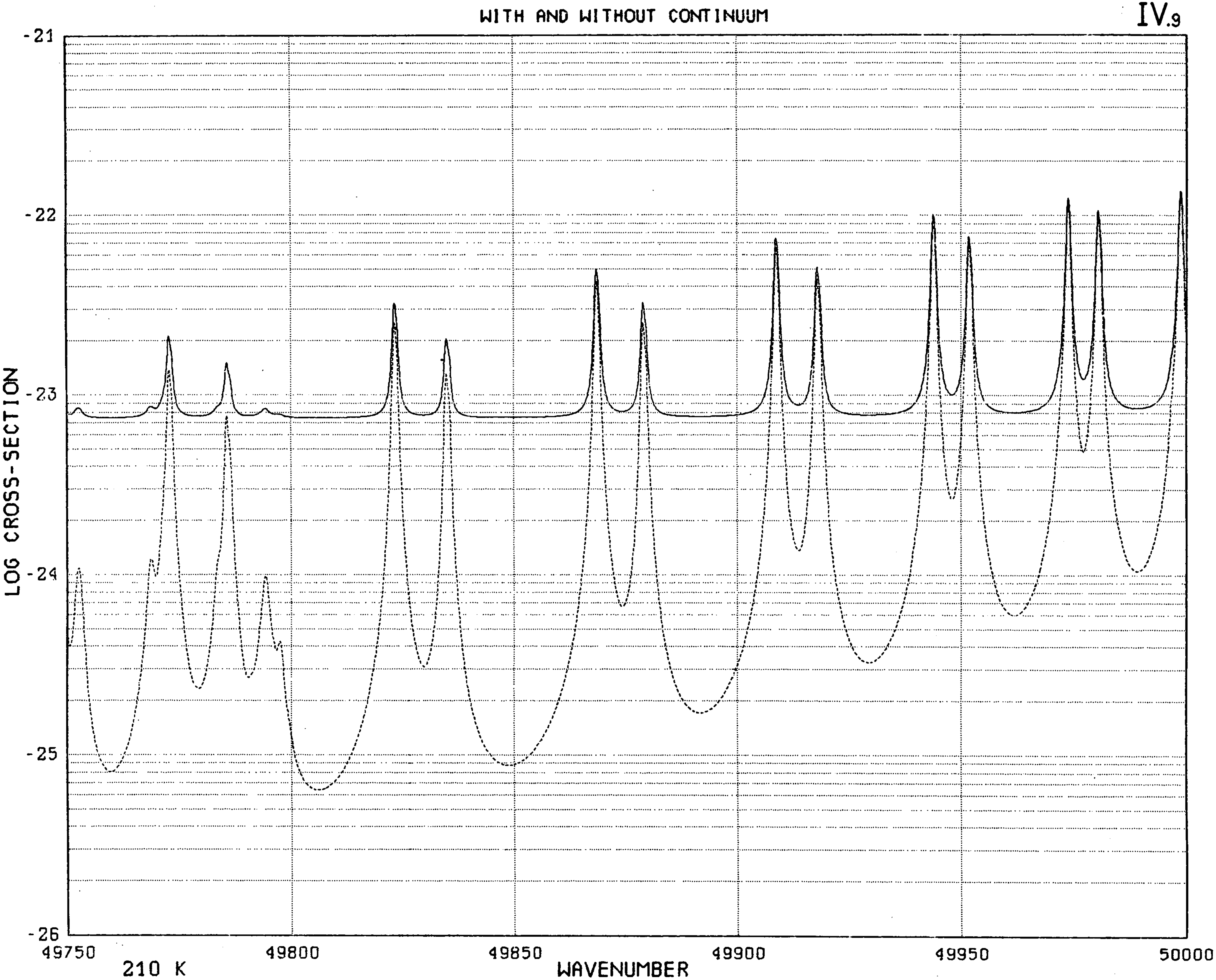

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-21
-22
-23
-24
49750
49800
49850
49900
49950
50000
WAVENUMBER
300-270-230-190 K

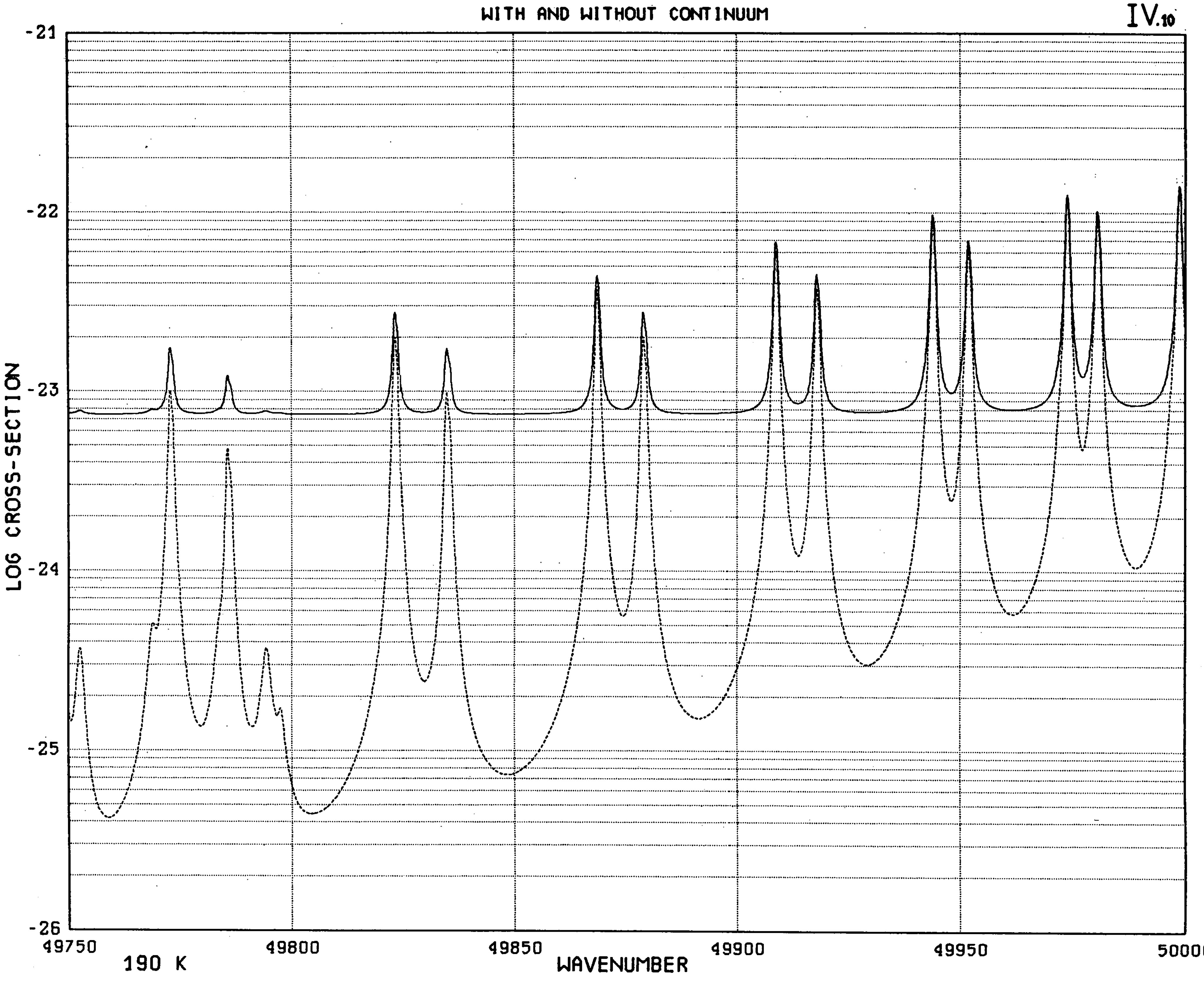

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
LOG CROSS-SECTION
49750
49800
49850
49900
49950
50000
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-21
-22
-23
-24
-25
49750
49800
49850
49900
49950
50000
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
LOG CROSS-SECTION
49750
49800
49850
49900
49950
50000
WAVENUMBER
250 K

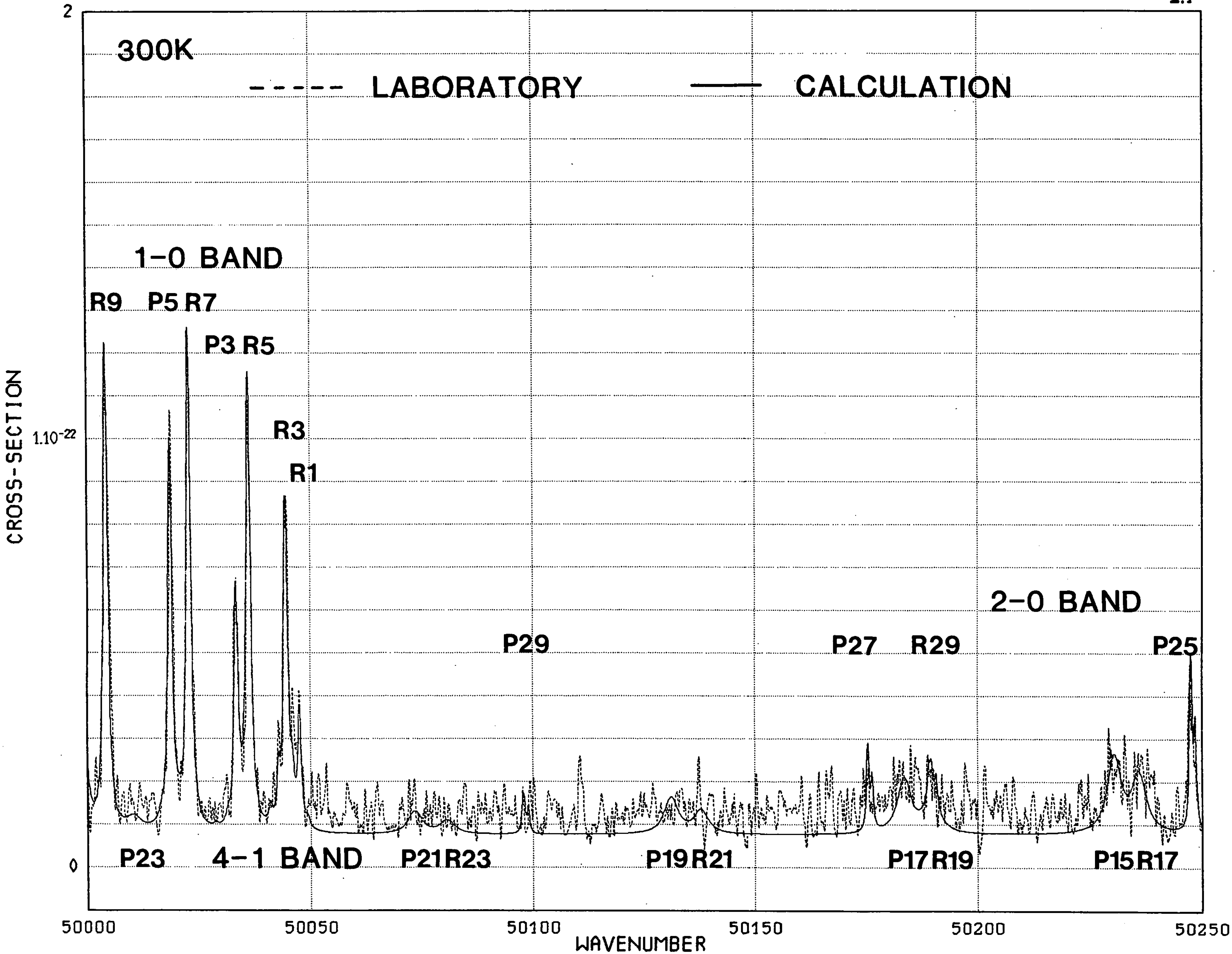

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
-26
LOG CROSS-SECTION
49750
49800
49850
49900
49950
50000
230 K
WAVENUMBER

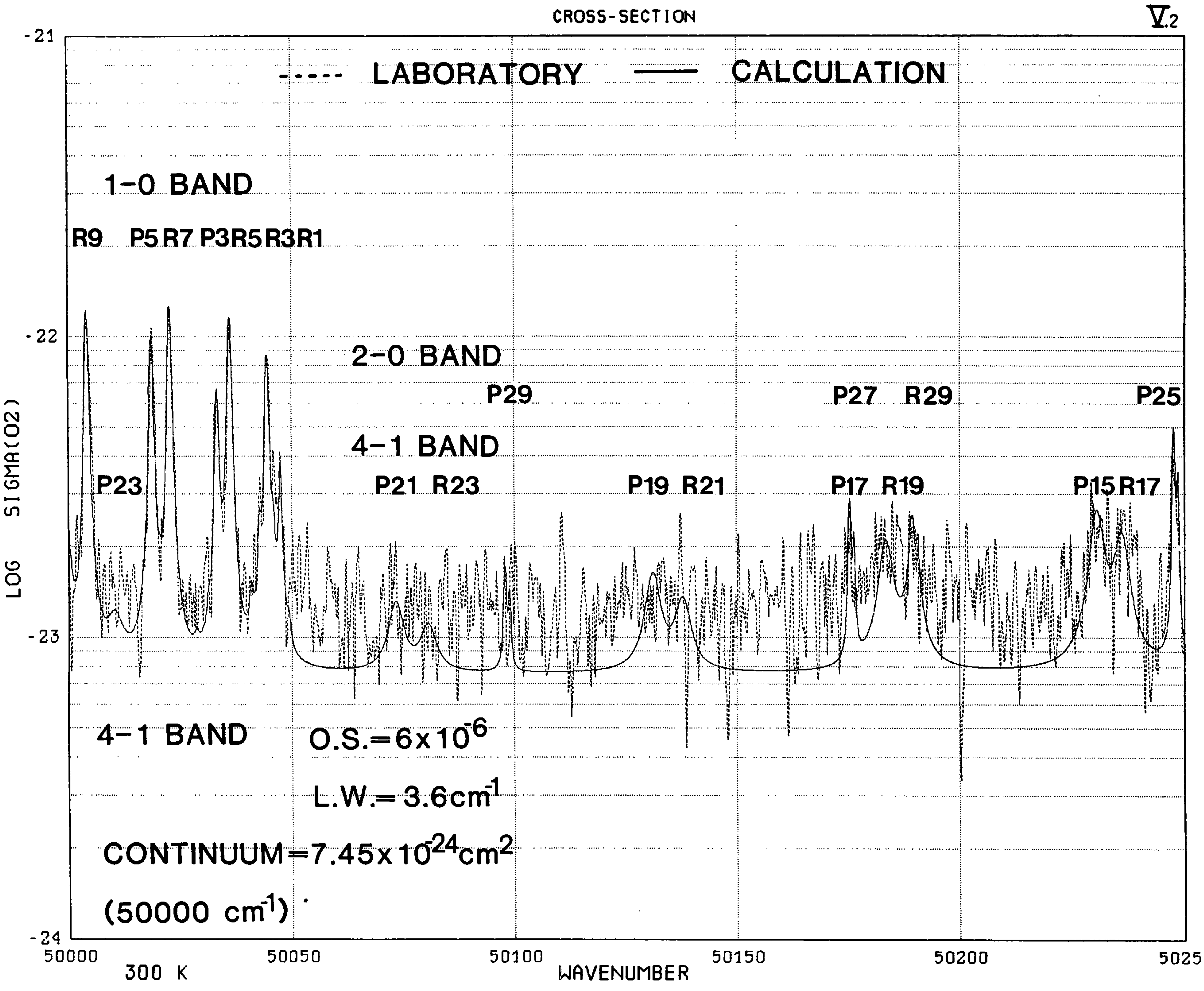

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-21
-22
-23
-24
-25
-26
49750
49800
49850
49900
49950
50000
210 K
WAVENUMBER

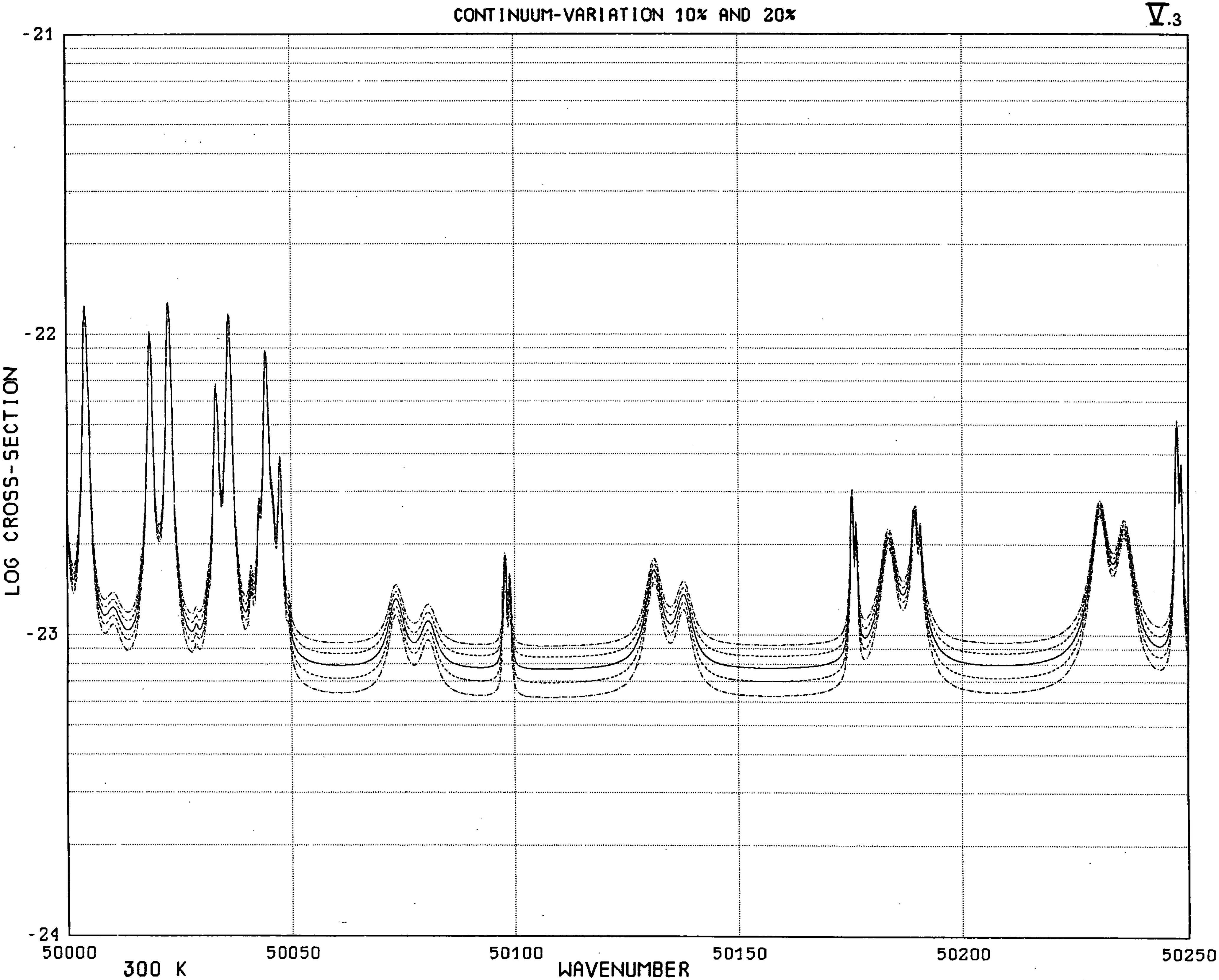

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
-26
LOG CROSS-SECTION
49750
49800
49850
49900
49950
50000
WAVENUMBER
190 K

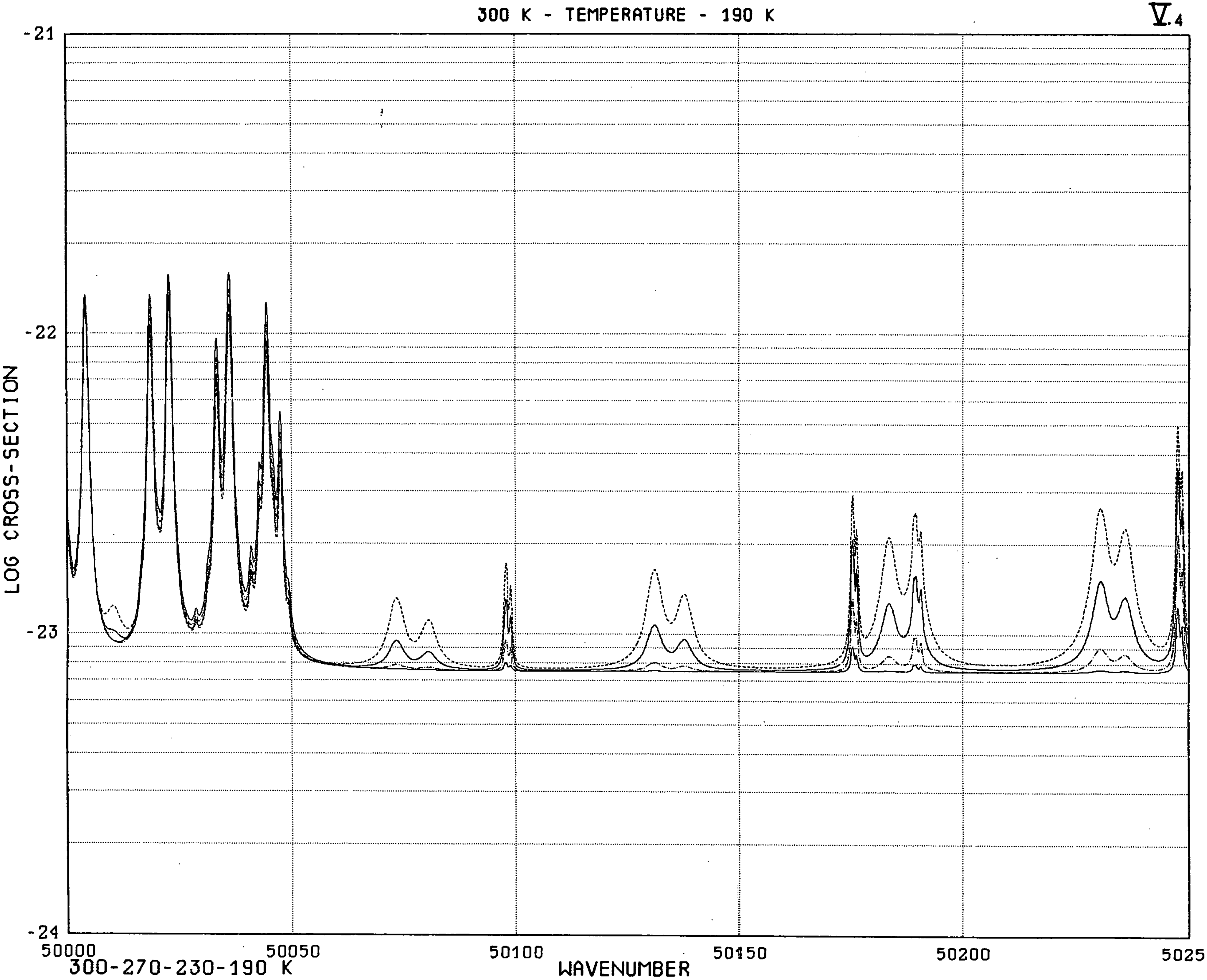
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
50000 - 50250 cm^{-1}

ν	λ	band
50000		
50004.0	1999.84	1-0 R 9
50004.1	1999.84	1-0 R 9
50004.6	1999.82	1-0 R 9
50009.9	1999.61	4-1 P23
50010.2	1999.59	4-1 P23
50010.9	1999.57	4-1 P23
50017.4	1999.30	4-1 R25
50018.0	1999.28	4-1 R25
50018.4	1999.26	1-0 P 5
50018.5	1999.26	1-0 P 5
50018.8	1999.25	1-0 P 5
50018.9	1999.25	4-1 R25
50022.6	1999.10	1-0 R 7
50022.6	1999.10	1-0 R 7
50023.0	1999.08	1-0 R 7
50033.1	1998.68	1-0 P 3
50033.2	1998.67	1-0 P 3
50033.5	1998.66	1-0 P 3
50036.0	1998.56	1-0 R 5
50036.1	1998.56	1-0 R 5
50036.4	1998.54	1-0 R 5
50042.8	1998.29	1-0 P 1
50044.3	1998.23	1-0 R 3
50044.4	1998.23	1-0 R 3
50044.8	1998.21	1-0 R 3
50045.8	1998.17	1-0 Q 1
50047.5	1998.10	1-0 R 1
50047.5	1998.10	1-0 R 1
50050		
50073.0	1997.09	4-1 P21
50073.3	1997.07	4-1 P21
50073.9	1997.05	4-1 P21
50080.1	1996.80	4-1 R23
50080.5	1996.78	4-1 R23
50081.4	1996.75	4-1 R23
50097.7	1996.10	2-0 P29
50098.0	1996.09	2-0 P29
50098.9	1996.05	2-0 P29
50100		
50130.8	1994.78	4-1 P19
50131.0	1994.77	4-1 P19
50131.6	1994.75	4-1 P19
50137.3	1994.52	4-1 R21
50137.7	1994.51	4-1 R21
50138.5	1994.48	4-1 R21
50150		
50175.2	1993.01	2-0 P27
50175.5	1993.00	2-0 P27
50176.4	1992.97	2-0 P27
50183.2	1992.70	4-1 P17
50183.4	1992.69	4-1 P17
50183.9	1992.67	4-1 P17
50189.1	1992.47	2-0 R29
50189.5	1992.45	4-1 R19
50190.3	1992.42	4-1 R19
50200		
50230.3	1990.83	4-1 P15
50230.4	1990.82	4-1 P15
50230.9	1990.80	4-1 P15
50235.7	1990.62	4-1 R17
50236.0	1990.60	4-1 R17
50236.6	1990.58	4-1 R17
50247.5	1990.15	2-0 P25
50247.8	1990.14	2-0 P25
50248.6	1990.11	2-0 P25

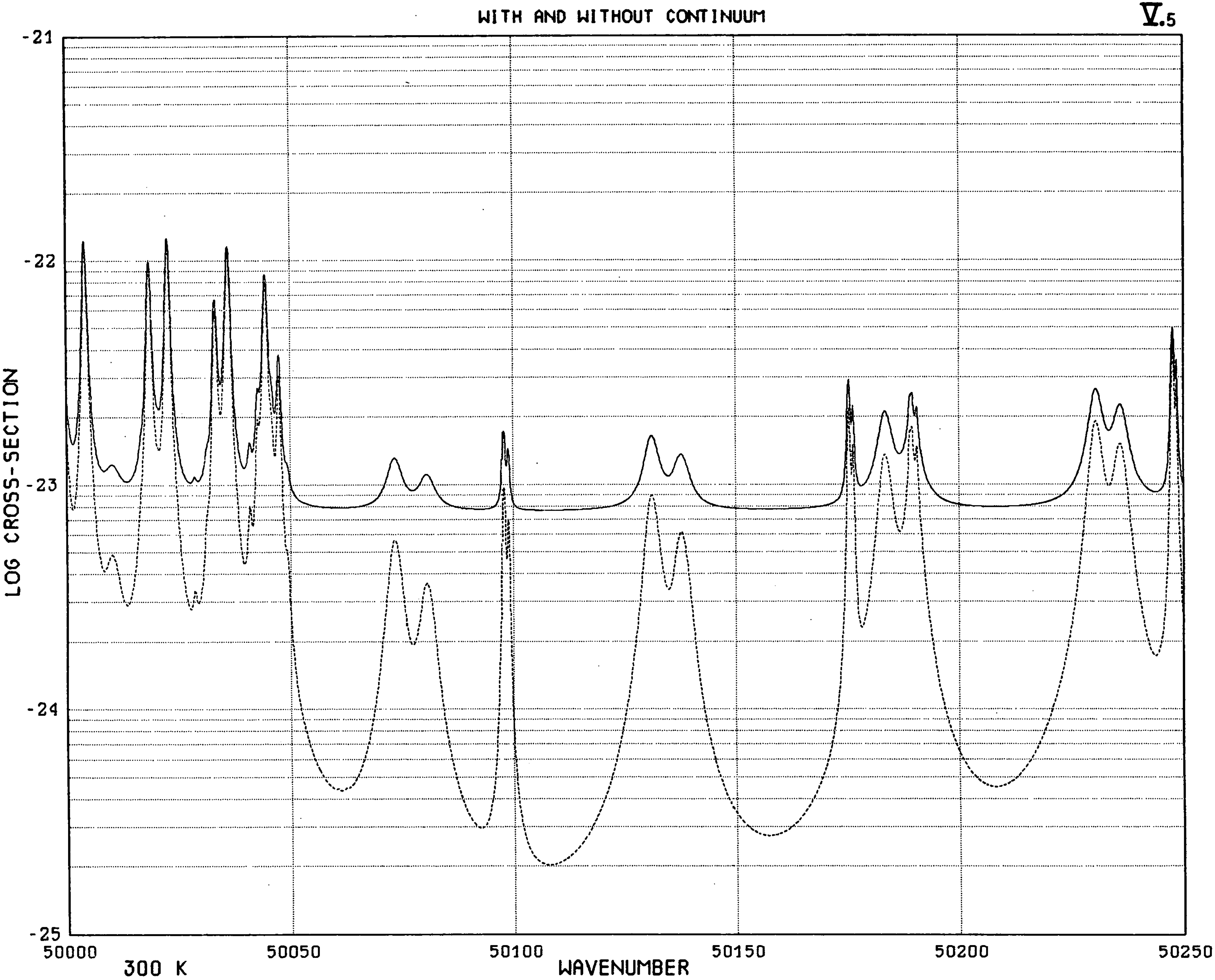

300K
LABORATORY
CALCULATION
1-0 BAND
R9
P5 R7
P3 R5
R3
R1
2-0 BAND
P29
P27
R29
P25
P23
4-1 BAND
P21 R23
P19 R21
P17 R19
P15 R17
2
1.10^{-22}
0
CROSS-SECTION
50000
50050
50100
50150
50200
50250
WAVENUMBER

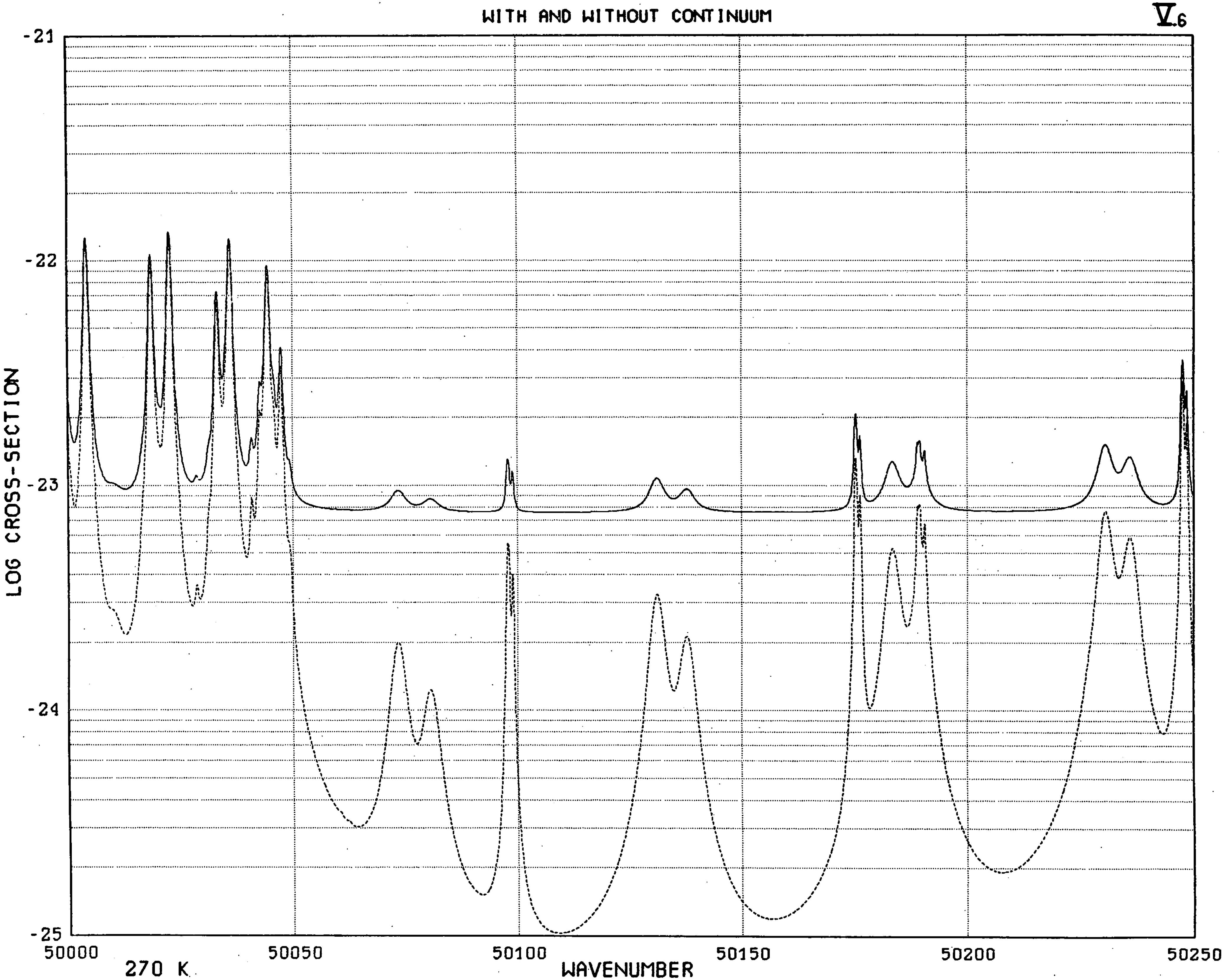

CROSS-SECTION
LABORATORY
CALCULATION
1-0 BAND
R9 P5 R7 P3 R5 R3 R1
P23
2-0 BAND
P29
P27 R29
P25
4-1 BAND
P21 R23
P19 R21
P17 R19
P15 R17
4-1 BAND
O.S.=6x10-6
L.W.=3.6cm-1
CONTINUUM=7.45x10-24cm2
(50000 cm-1)
LOG SIGMA(O2)
-21
-22
-23
-24
50000
50050
50100
50150
50200
50250
300 K
WAVENUMBER

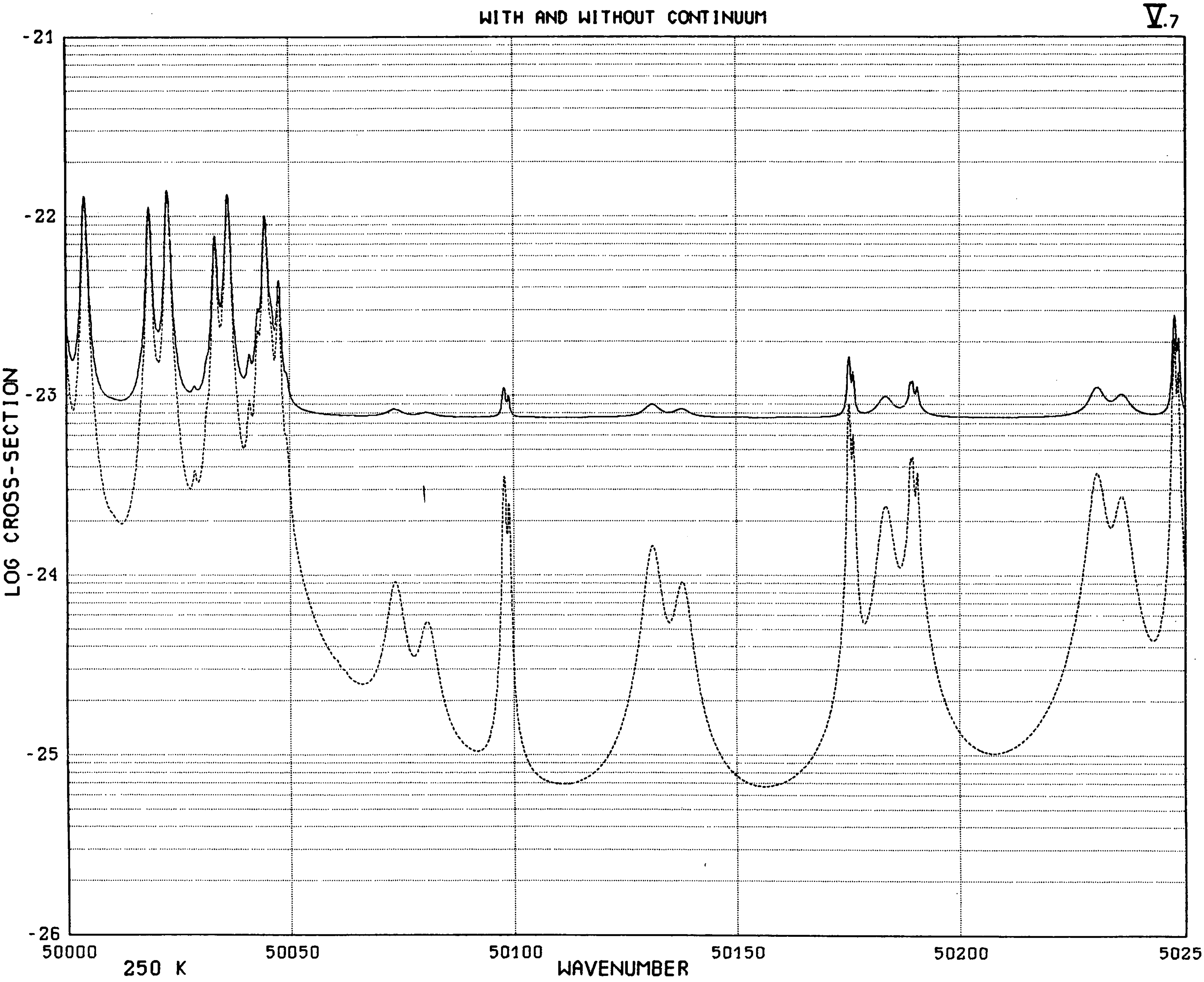

CONTINUUM-VARIATION 10% AND 20%
-21
-22
-23
-24
LOG CROSS-SECTION
50000
50050
50100
50150
50200
50250
300 K
WAVENUMBER

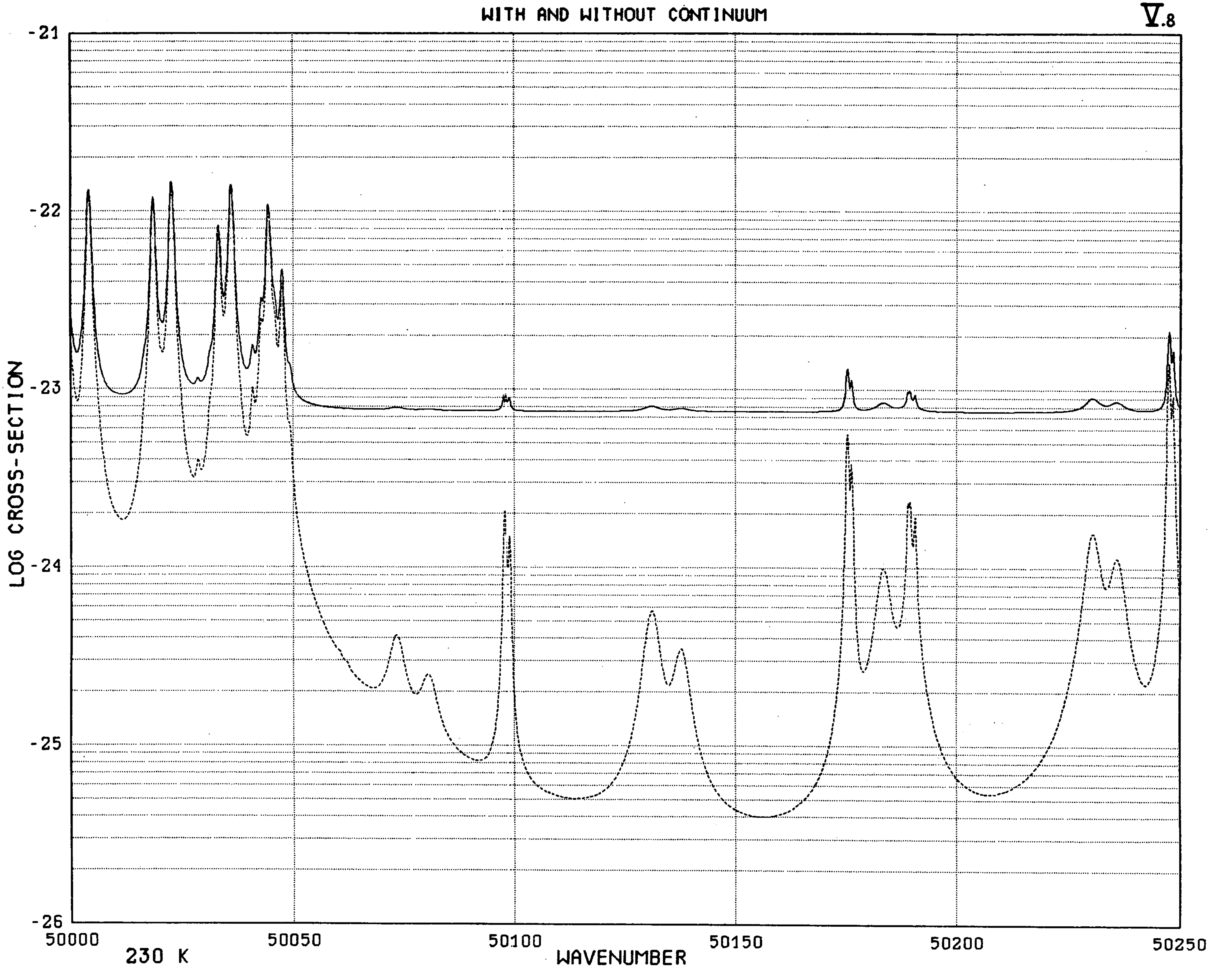

300 K - TEMPERATURE - 190 K
V.4
LOG CROSS-SECTION
-21
-22
-23
-24
50000
50050
50100
50150
50200
50250
300-270-230-190 K
WAVENUMBER

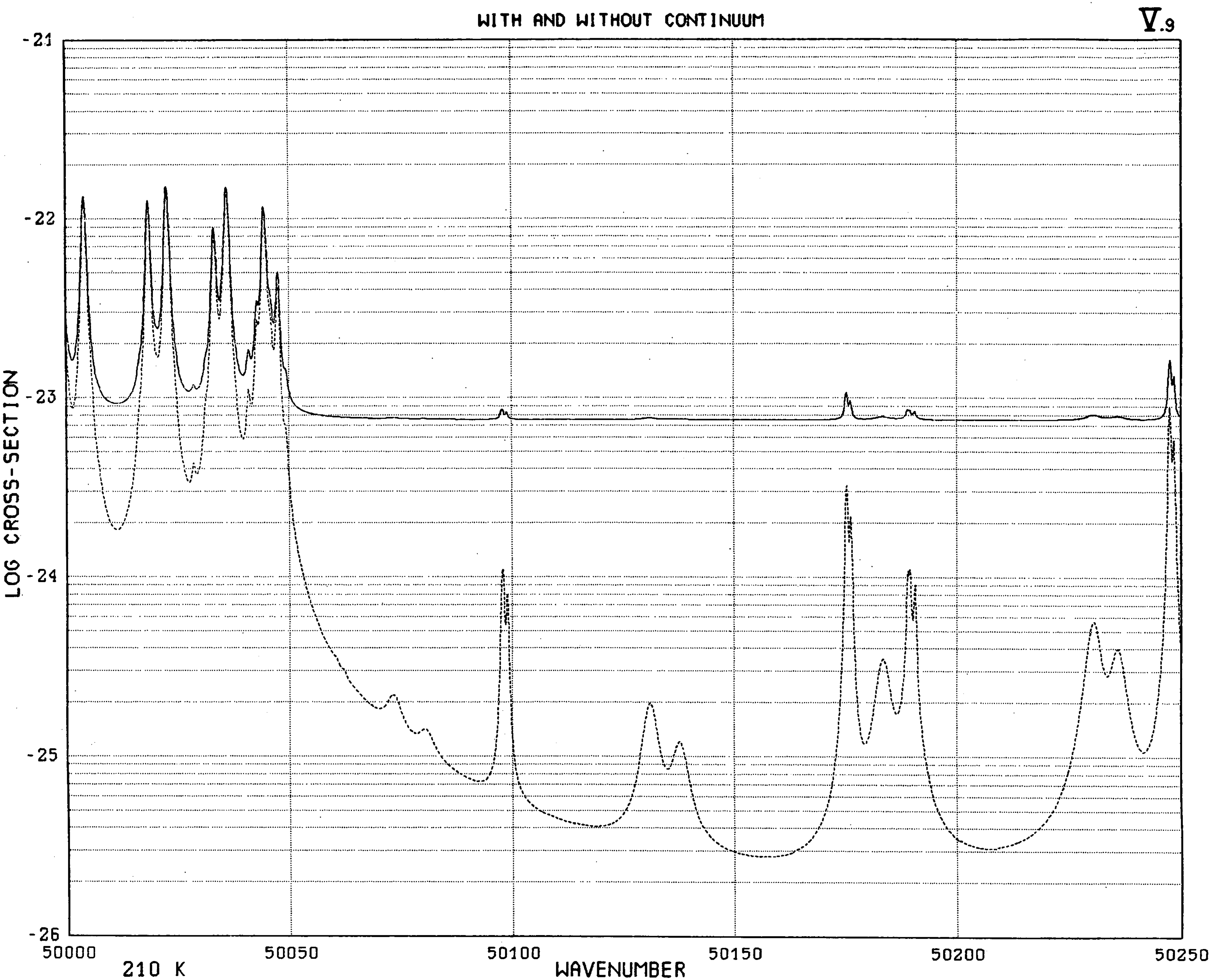
V.5

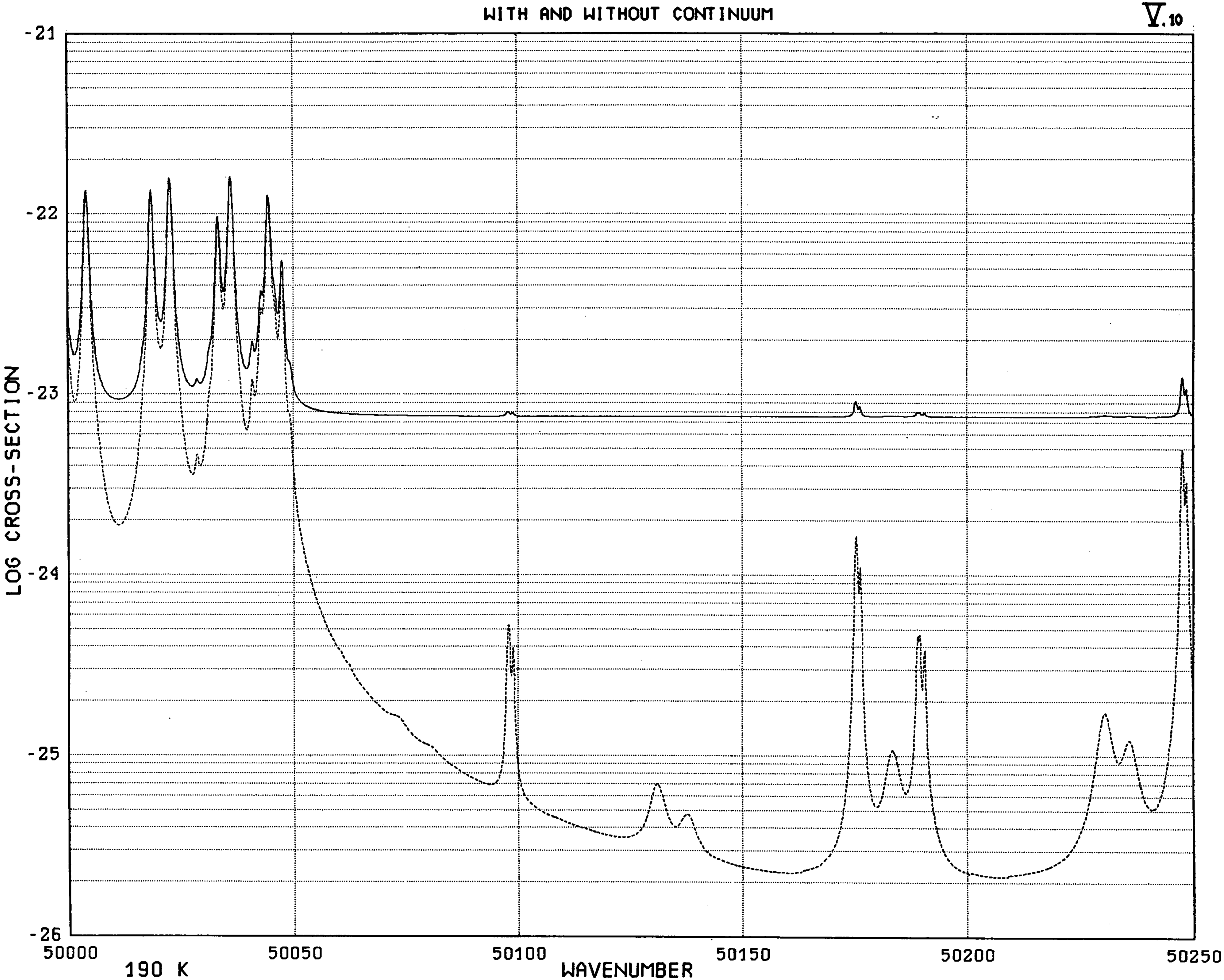

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50000
50050
50100
50150
50200
50250
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
V.6
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50000
50050
50100
50150
50200
50250
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-21
-22
-23
-24
-25
-26
50000
50050
50100
50150
50200
50250
250 K
WAVENUMBER

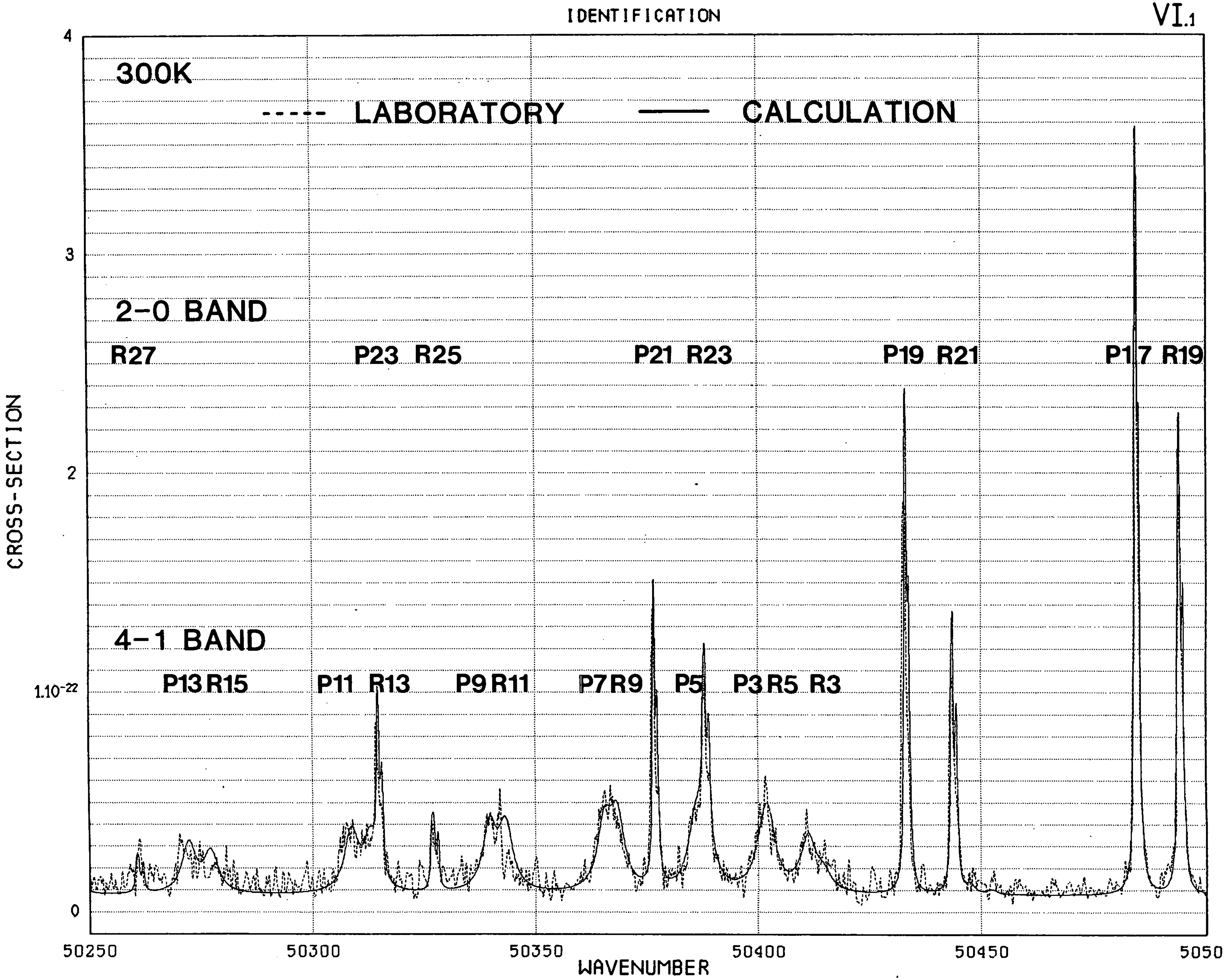

WITH AND WITHOUT CONTINUUM
V.8
LOG CROSS-SECTION
-21
-22
-23
-24
-25
-26
50000
50050
50100
50150
50200
50250
230 K
WAVENUMBER

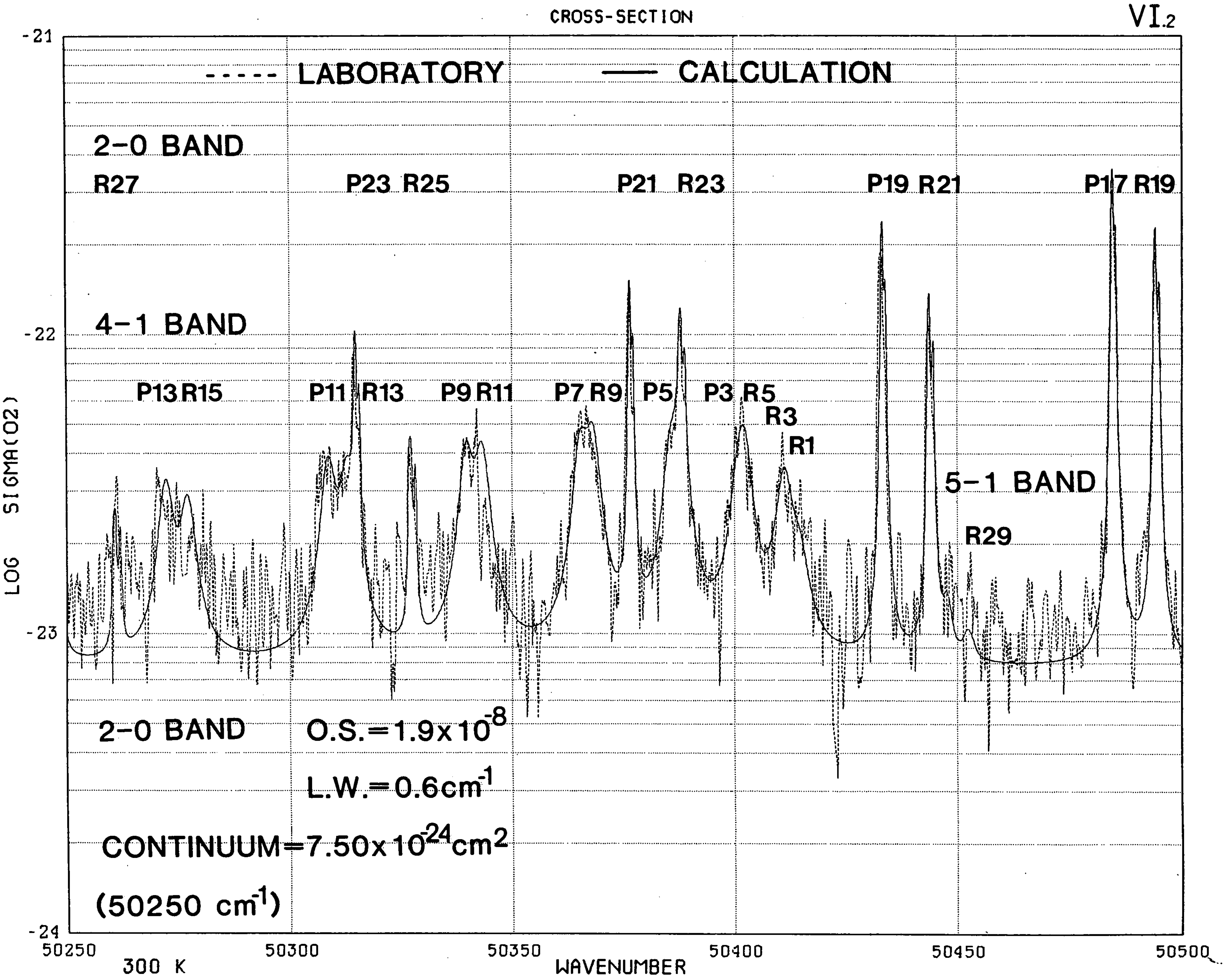

WITH AND WITHOUT CONTINUUM
V.9
LOG CROSS-SECTION
-21
-22
-23
-24
-25
-26
50000
50050
50100
50150
50200
50250
210 K
WAVENUMBER

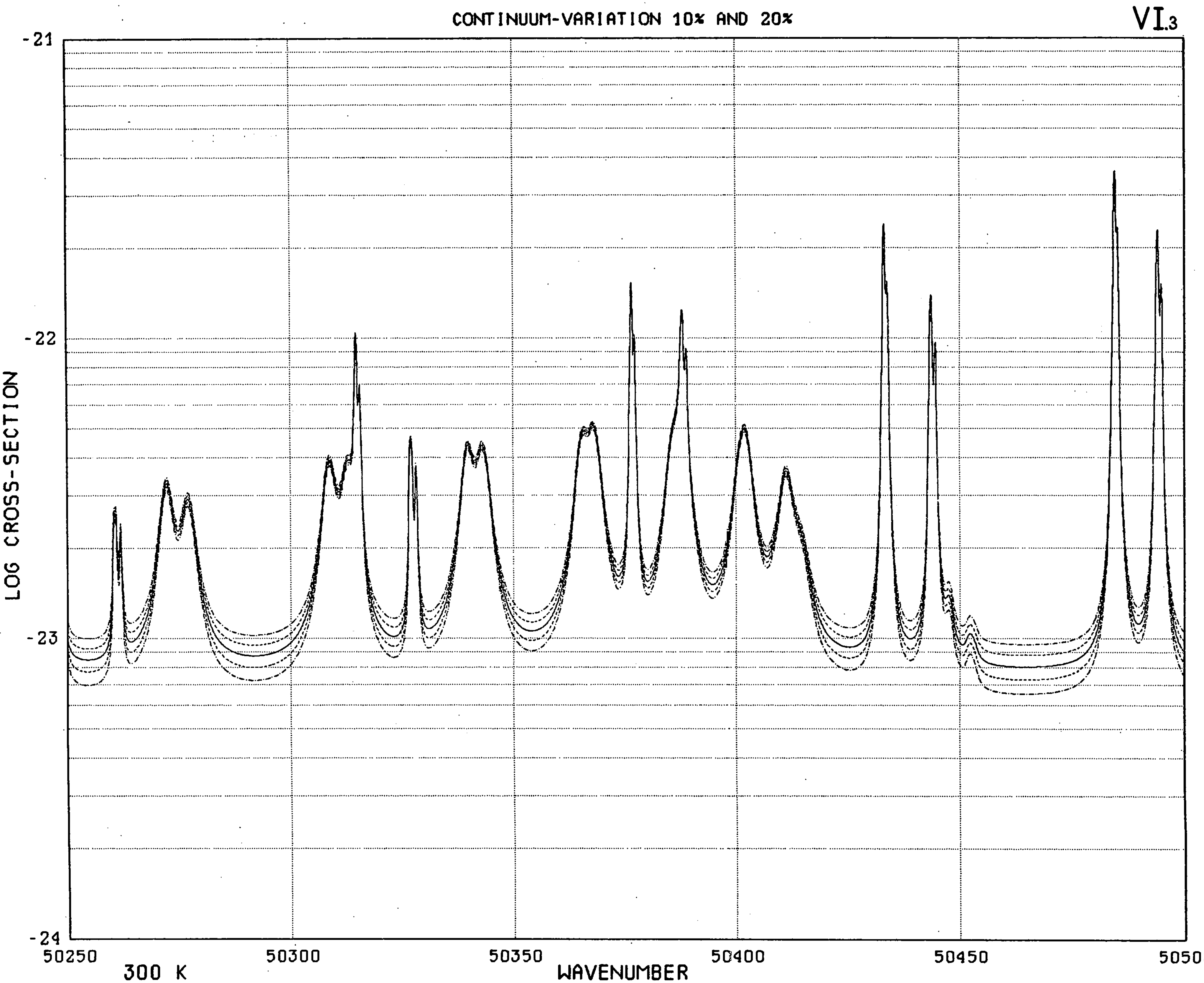

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
-26
LOG CROSS-SECTION
50000
50050
50100
50150
50200
50250
190 K
WAVENUMBER

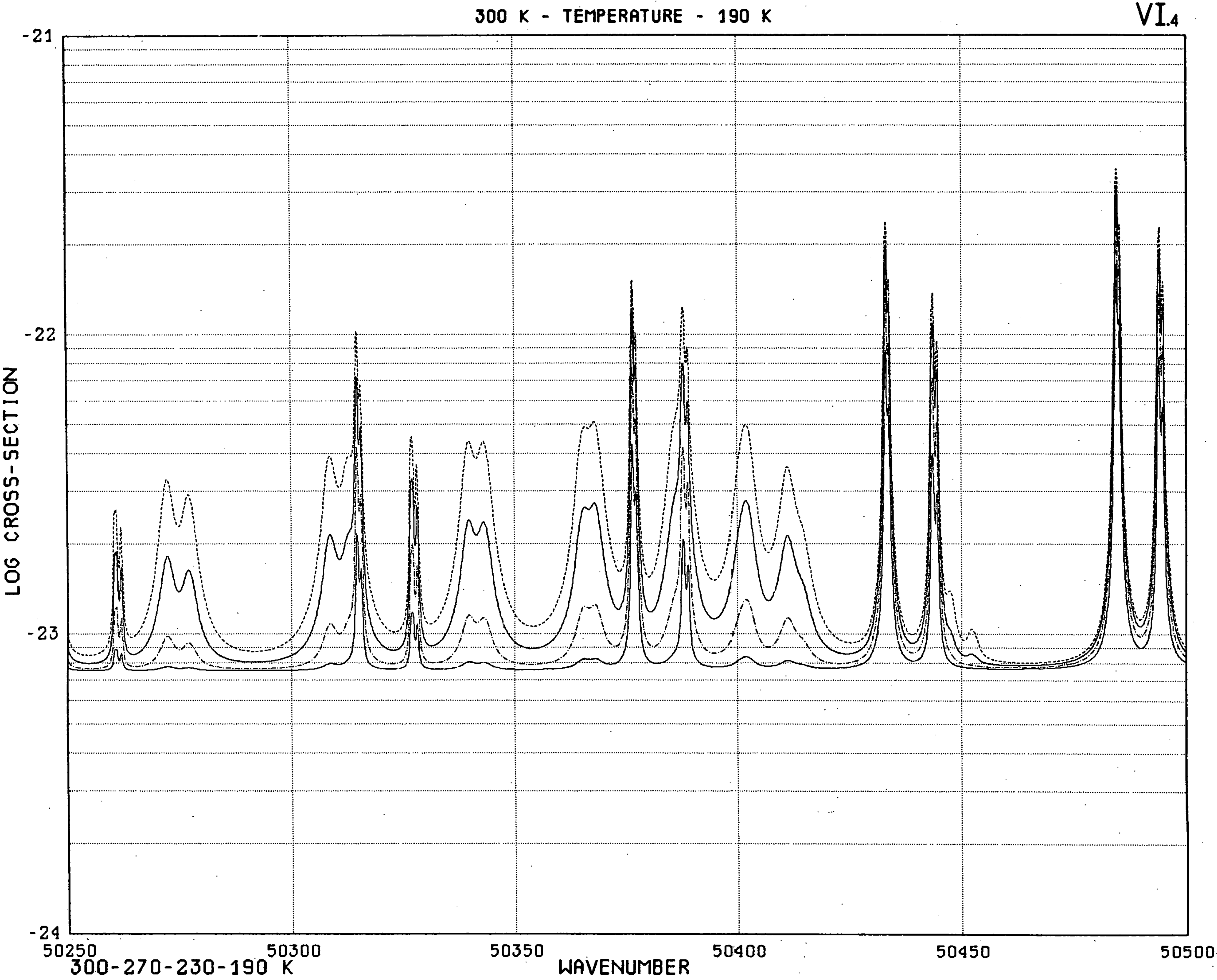
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
50250 - 50500 cm^{-1}

v	λ	band	v	λ	band
50250			50388.3	1984.59	4-1 R 7
50260.5	1989.63	2-0 R27	50389.0	1984.56	2-0 R23
50261.0	1989.61	2-0 R27	50400		
50262.0	1989.57	2-0 R27	50400.6	1984.10	4-1 P 3
50272.0	1989.18	4-1 P13	50400.6	1984.10	4-1 P 3
50272.1	1989.17	4-1 P13	50401.0	1984.09	4-1 P 3
50272.6	1989.15	4-1 P13	50402.1	1984.04	4-1 R 5
50276.8	1988.99	4-1 R15	50402.2	1984.04	4-1 R 5
50277.1	1988.98	4-1 R15	50402.6	1984.02	4-1 R 5
50277.7	1988.96	4-1 R15	50410.2	1983.72	4-1 P 1
50300			50411.1	1983.69	4-1 R 3
50308.4	1987.74	4-1 P11	50411.2	1983.69	4-1 R 3
50308.5	1987.74	4-1 P11	50411.6	1983.67	4-1 R 3
50308.9	1987.72	4-1 P11	50413.2	1983.61	4-1 Q 1
50312.6	1987.57	4-1 R13	50414.8	1983.55	4-1 R 1
50312.8	1987.57	4-1 R13	50414.8	1983.54	4-1 R 1
50313.3	1987.54	4-1 R13	50433.1	1982.82	2-0 P19
50314.6	1987.49	2-0 P23	50433.2	1982.82	2-0 P19
50314.8	1987.49	2-0 P23	50433.9	1982.79	2-0 P19
50315.6	1987.46	2-0 P23	50443.5	1982.42	2-0 R21
50326.8	1987.01	2-0 R25	50443.8	1982.41	2-0 R21
50327.2	1987.00	2-0 R25	50444.6	1982.37	2-0 R21
50328.1	1986.96	2-0 R25	50447.3	1982.26	5-1 P27
50339.5	1986.51	4-1 P 9	50447.5	1982.26	5-1 P27
50339.5	1986.51	4-1 P 9	50448.1	1982.23	5-1 P27
50339.9	1986.49	4-1 P 9	50450		
50343.0	1986.37	4-1 R11	50452.0	1982.08	5-1 R29
50343.2	1986.37	4-1 R11	50452.3	1982.07	5-1 R29
50343.7	1986.35	4-1 R11	50453.2	1982.04	5-1 R29
50350			50484.5	1980.81	2-0 P17
50365.2	1985.50	4-1 P 7	50484.6	1980.80	2-0 P17
50365.2	1985.50	4-1 P 7	50485.2	1980.78	2-0 P17
50365.6	1985.48	4-1 P 7	50494.0	1980.43	2-0 R19
50366.3	1985.46	5-1 P29	50494.2	1980.43	2-0 R19
50366.5	1985.45	5-1 P29	50495.0	1980.40	2-0 R19
50367.1	1985.42	5-1 P29			
50368.1	1985.38	4-1 R 9			
50368.2	1985.38	4-1 R 9			
50368.6	1985.36	4-1 R 9			
50376.5	1985.05	2-0 P21			
50376.6	1985.05	2-0 P21			
50377.3	1985.02	2-0 P21			
50385.6	1984.69	4-1 P 5			
50385.6	1984.69	4-1 P 5			
50386.0	1984.68	4-1 P 5			
50387.8	1984.61	2-0 R23			
50387.9	1984.60	4-1 R 7			

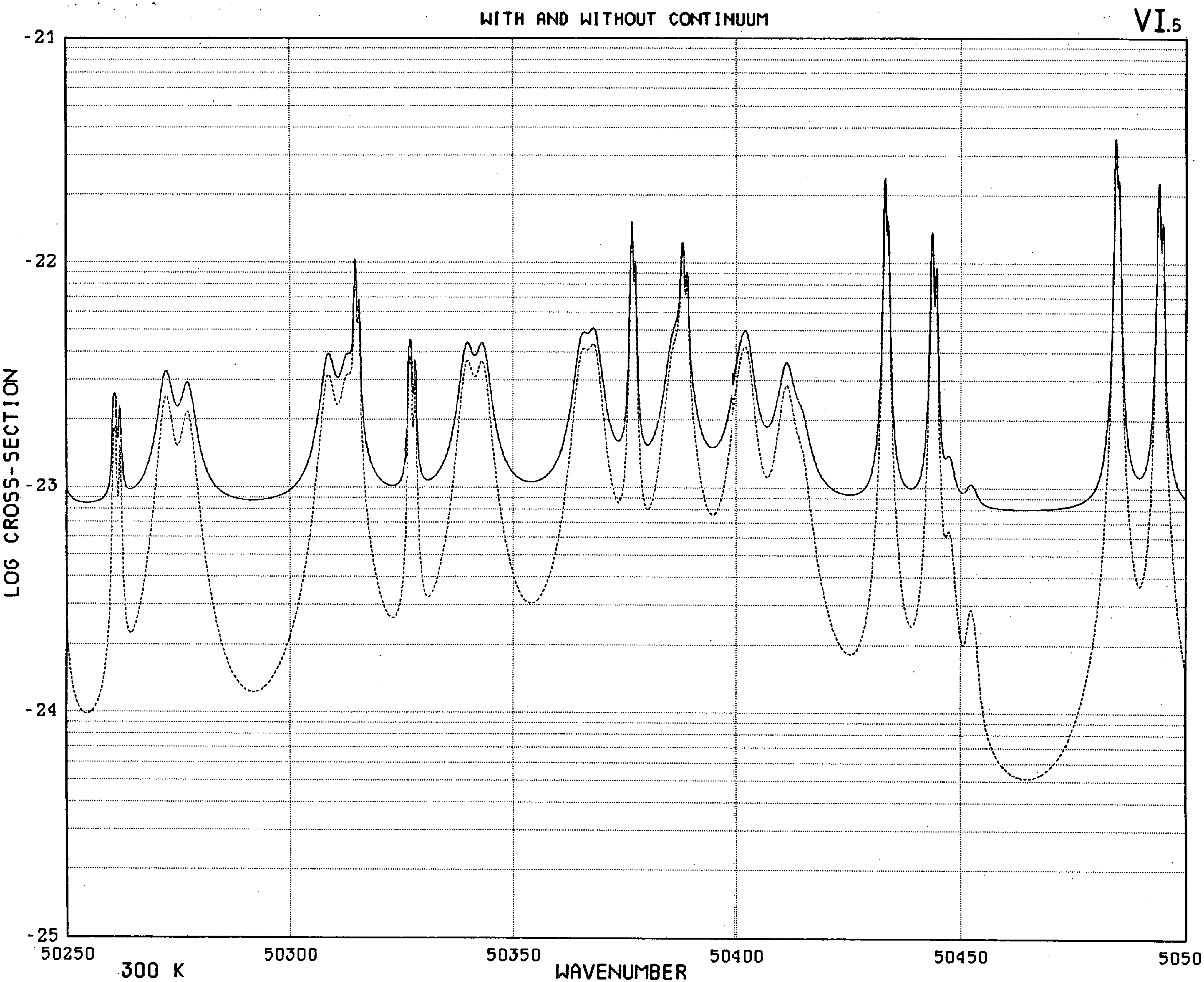

IDENTIFICATION
300K
----- LABORATORY
CALCULATION
2-0 BAND
R27
P23 R25
P21 R23
P19 R21
P17 R19
4-1 BAND
P13 R15
P11 R13
P9 R11
P7 R9
P5
P3 R5 R3
CROSS-SECTION
4
3
2
1.10^-22
0
WAVENUMBER
50250
50300
50350
50400
50450
50500

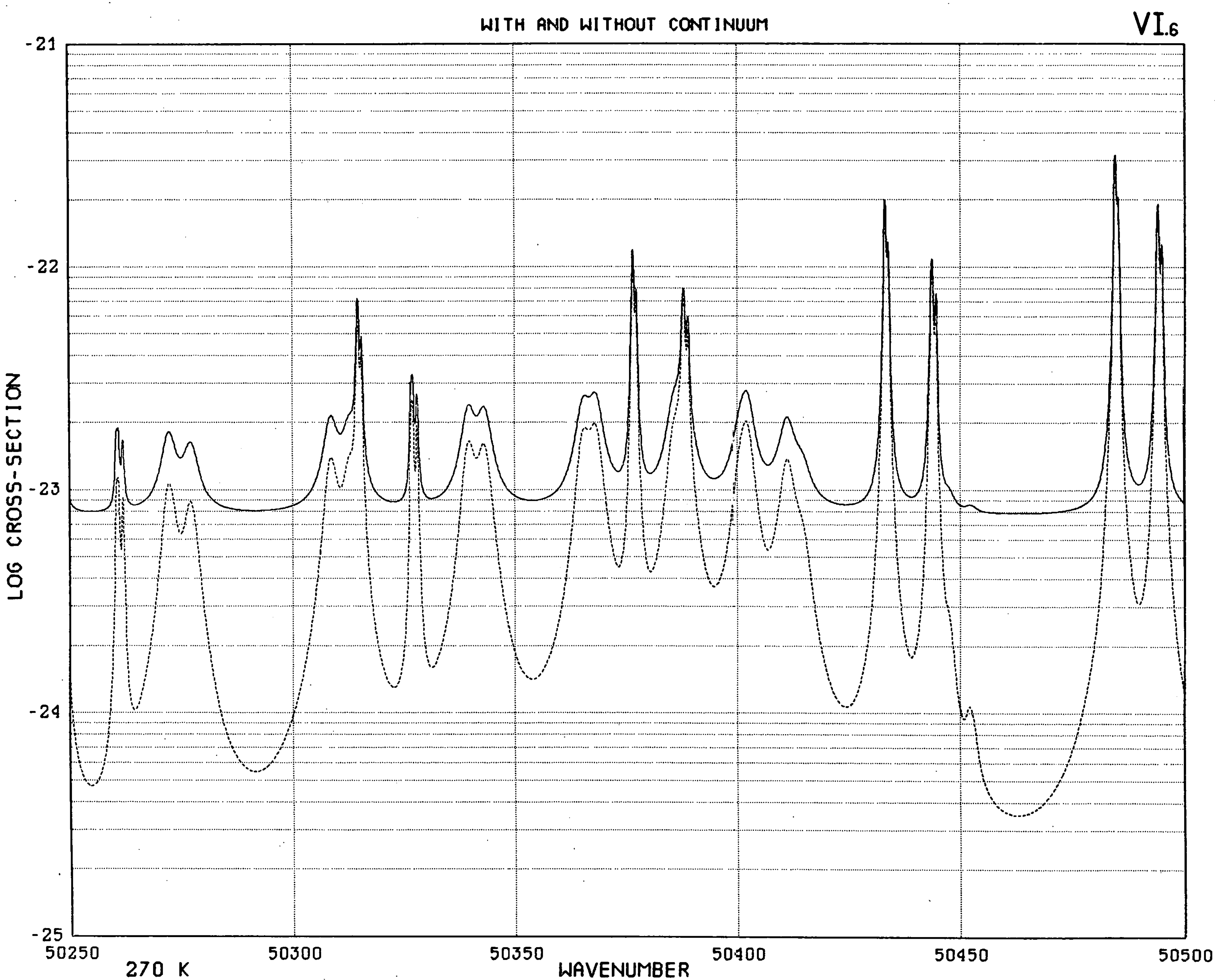

CROSS-SECTION
----- LABORATORY
—— CALCULATION
2-0 BAND
R27
P23 R25
P21 R23
P19 R21
P17 R19
4-1 BAND
P13 R15
P11 R13
P9 R11
P7 R9
P5
P3 R5
R3
R1
5-1 BAND
R29
2-0 BAND
O.S.=1.9x10-8
L.W.=0.6cm-1
CONTINUUM=7.50x10-24cm2
(50250 cm-1)
LOG SIGMA(O2)
-21
-22
-23
-24
50250
50300
50350
50400
50450
50500
300 K
WAVENUMBER


CONTINUUM-VARIATION 10% AND 20%
VI.3
-21
-22
-23
-24
LOG CROSS-SECTION
50250
50300
50350
50400
50450
50500
300 K
WAVENUMBER

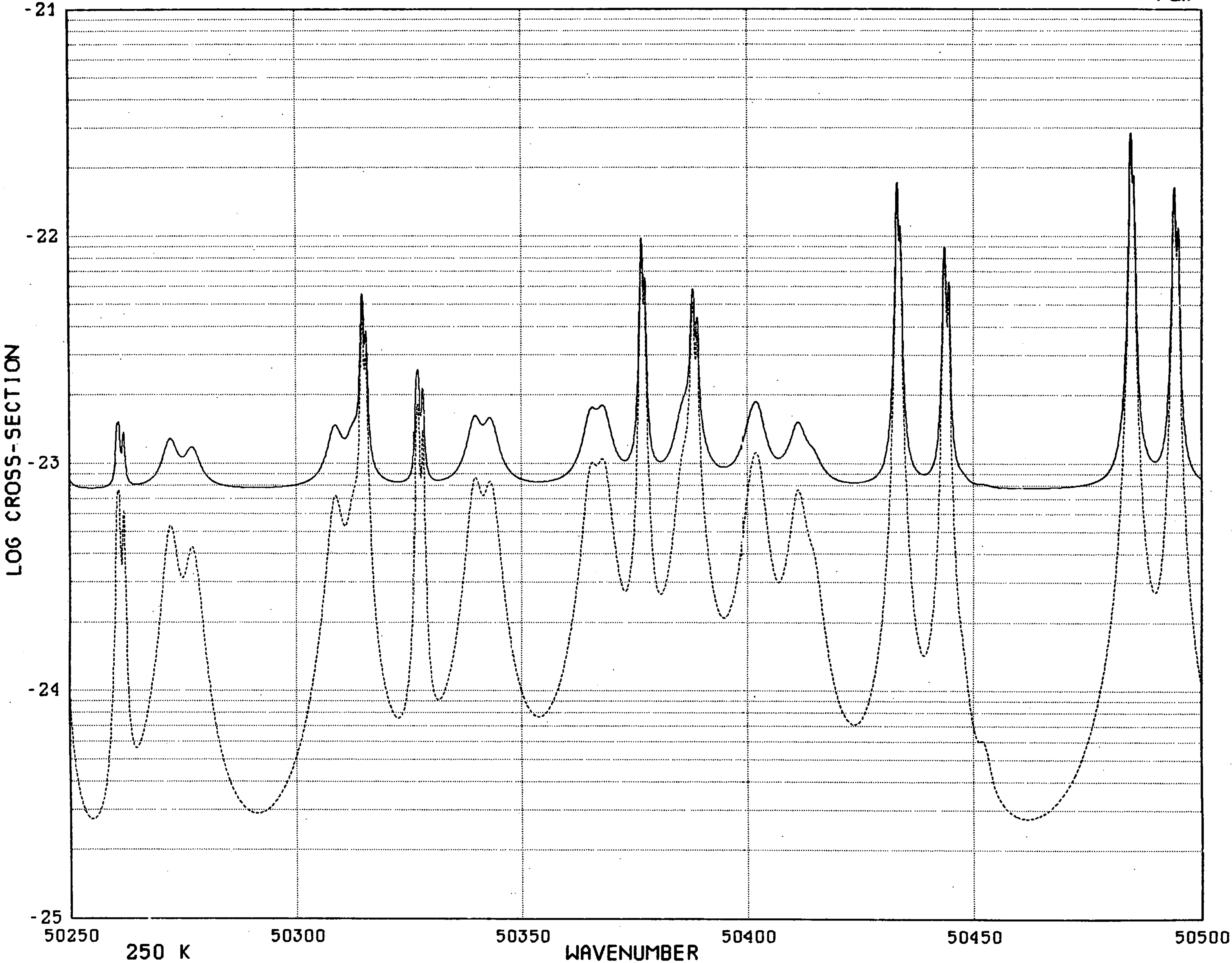


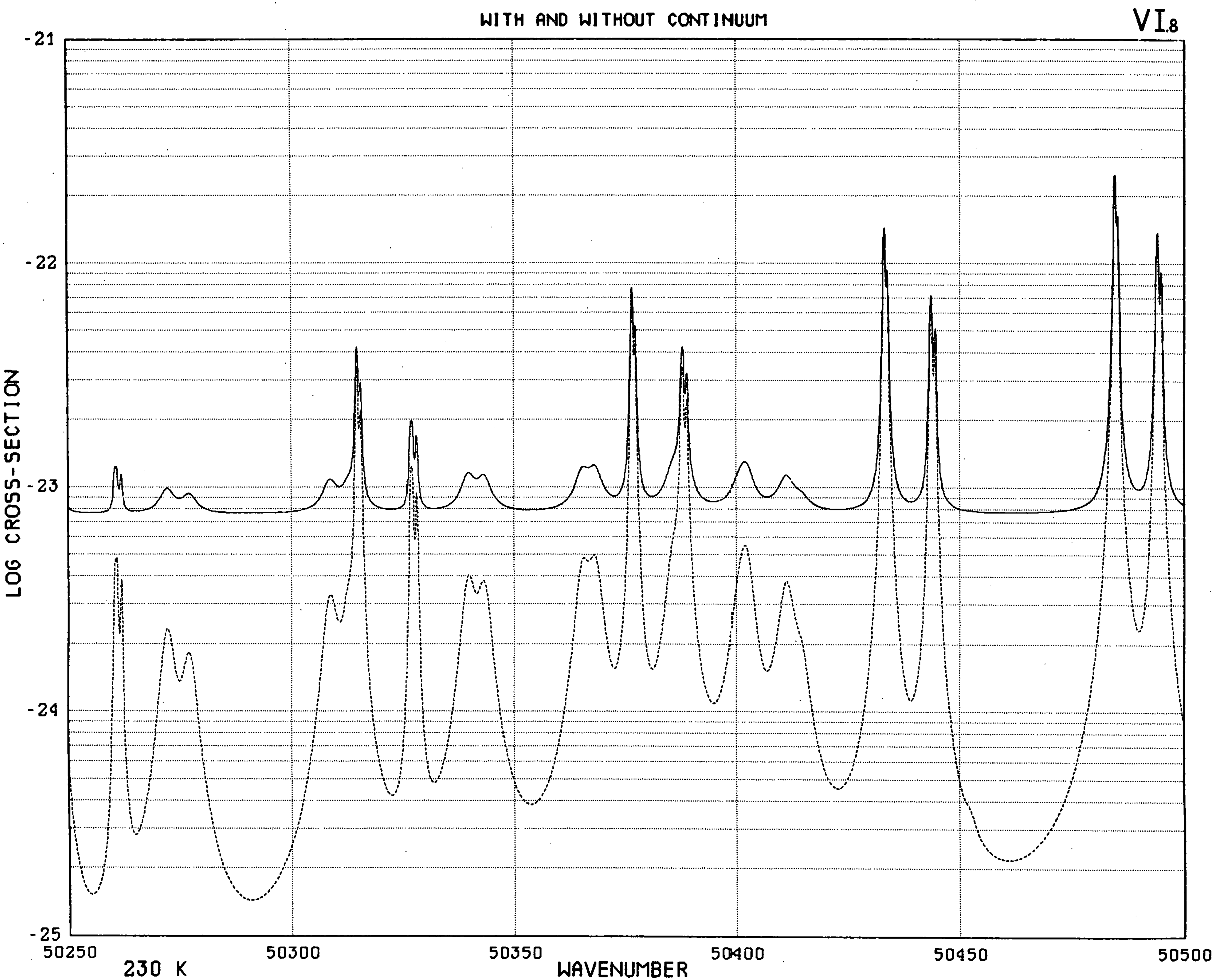
300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-21
-22
-23
-24
50250
50300
50350
50400
50450
50500
WAVENUMBER
300-270-230-190 K

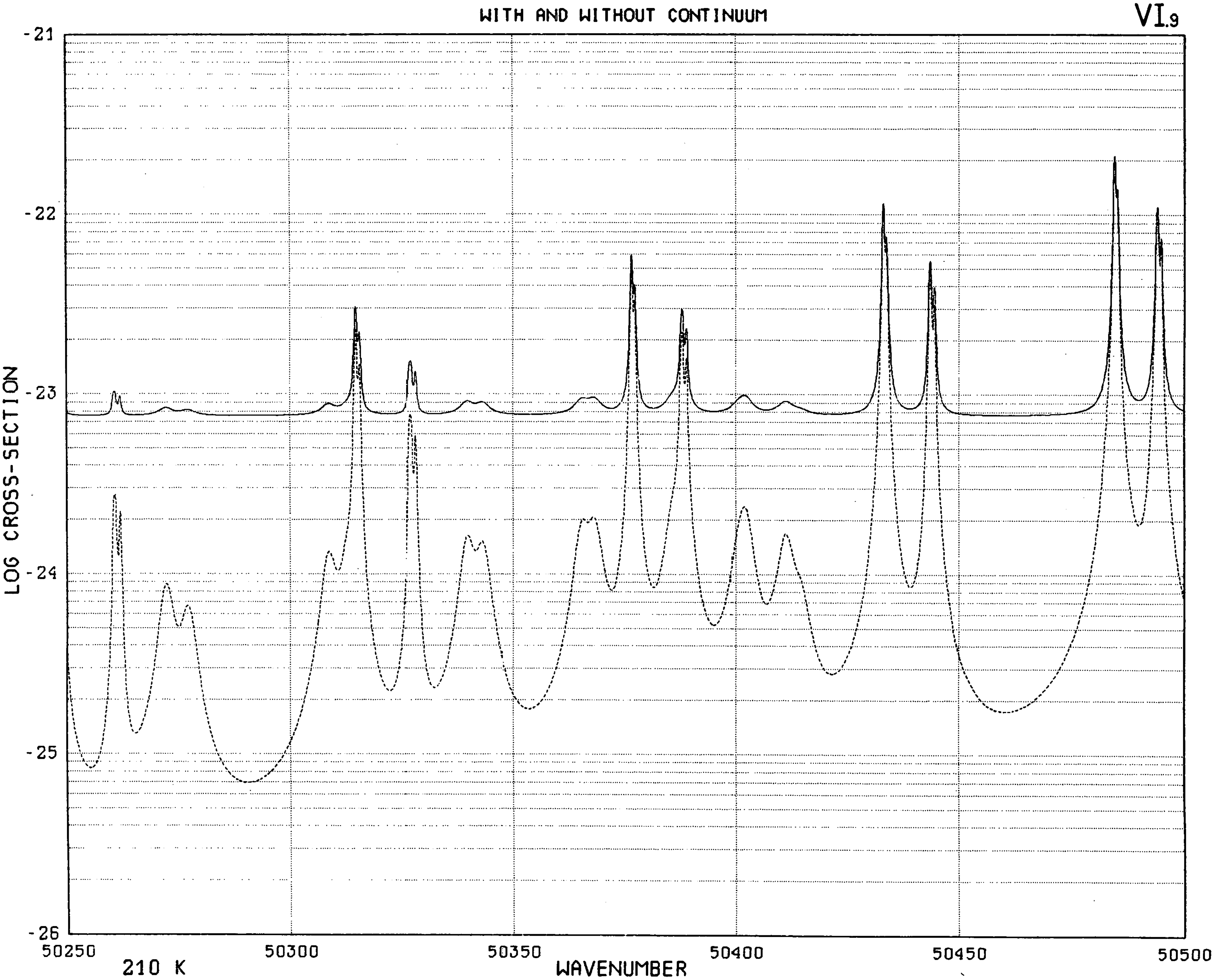

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50250
50300
50350
50400
50450
50500
300 K
WAVENUMBER

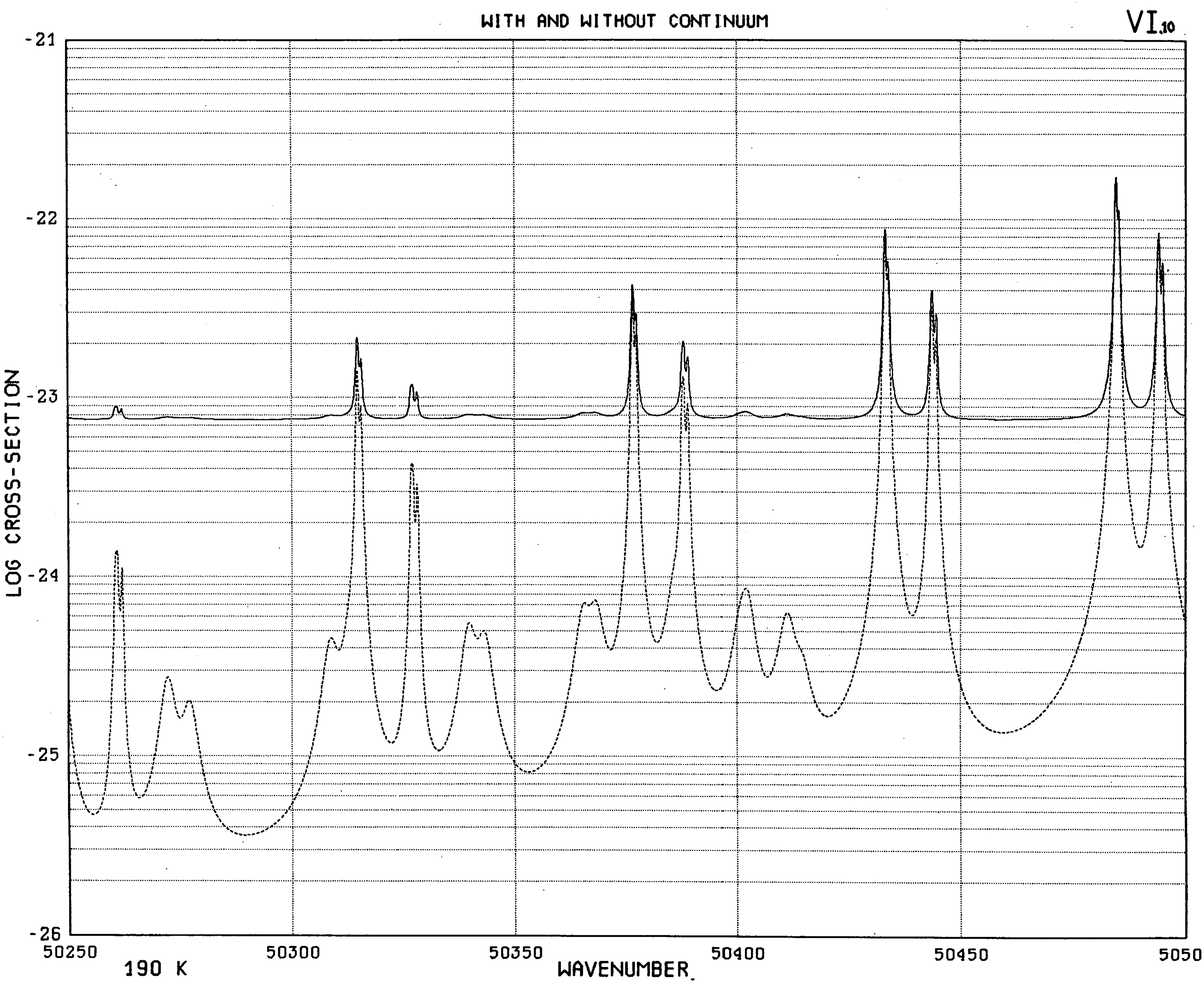

WITH AND WITHOUT CONTINUUM
VI.6
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50250
50300
50350
50400
50450
50500
270 K
WAVENUMBER

WITH AND WITHOUT CONTINUUM



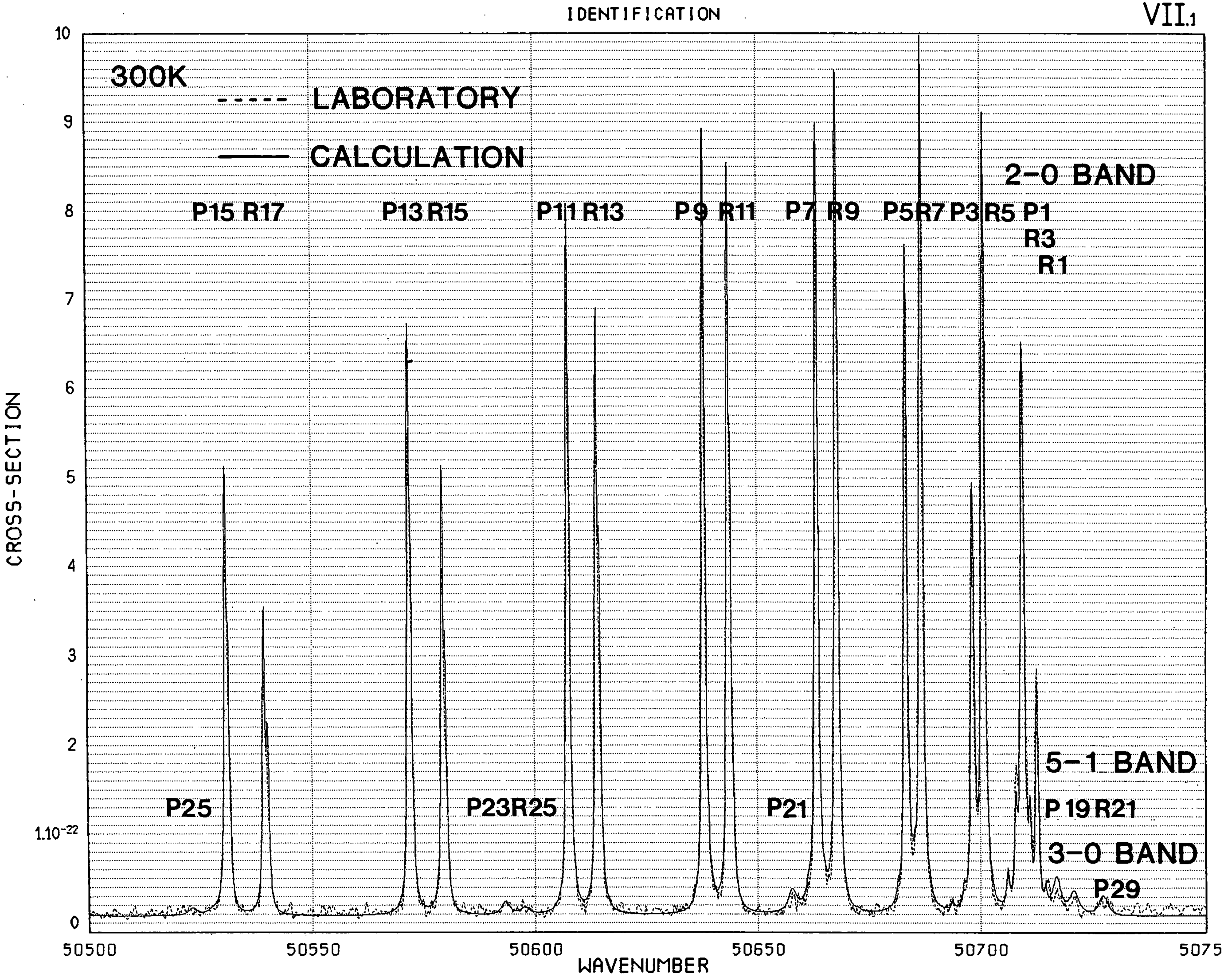

WITH AND WITHOUT CONTINUUM
VI.8
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50250
50300
50350
50400
50450
50500
230 K
WAVENUMBER

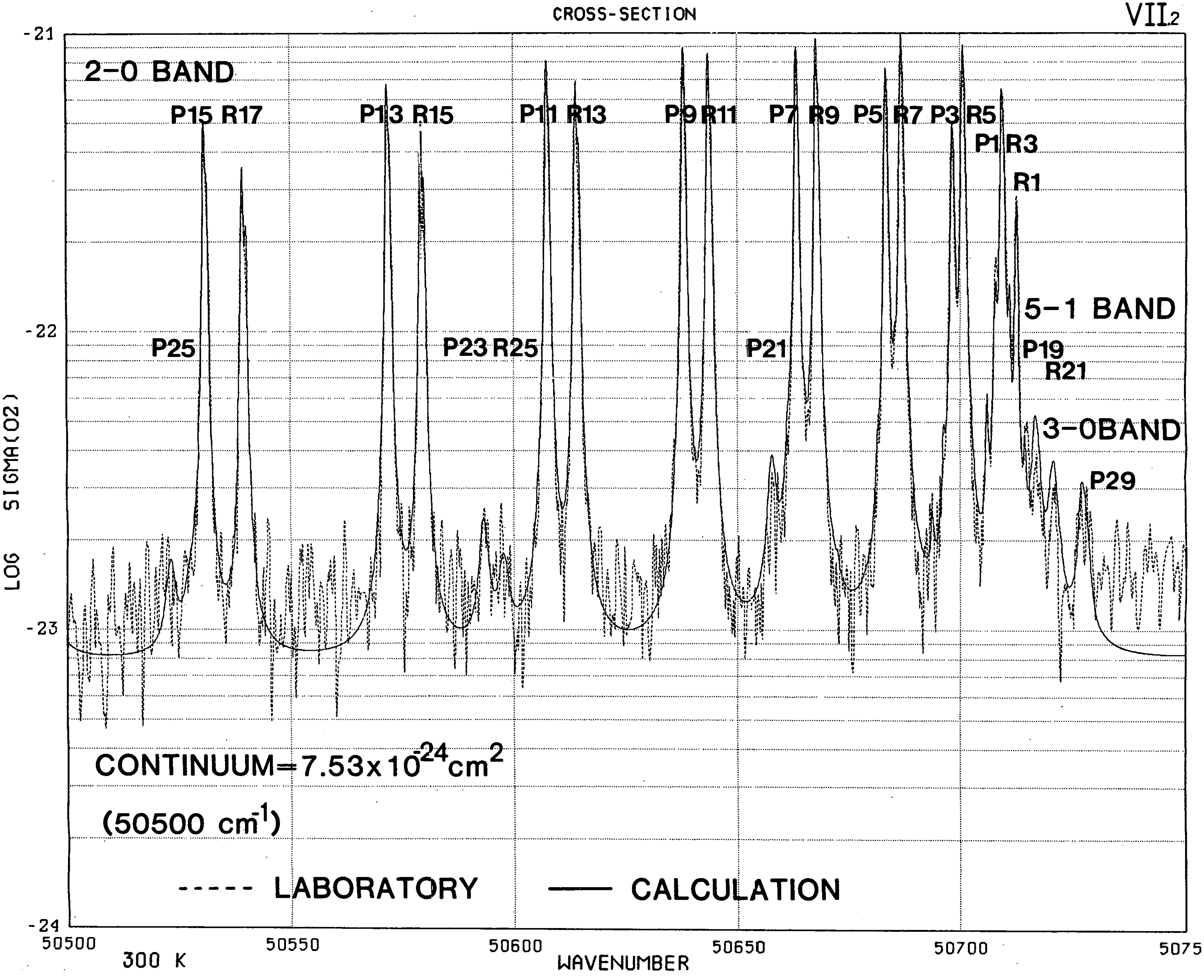

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
-26
LOG CROSS-SECTION
50250
50300
50350
50400
50450
50500
210 K
WAVENUMBER

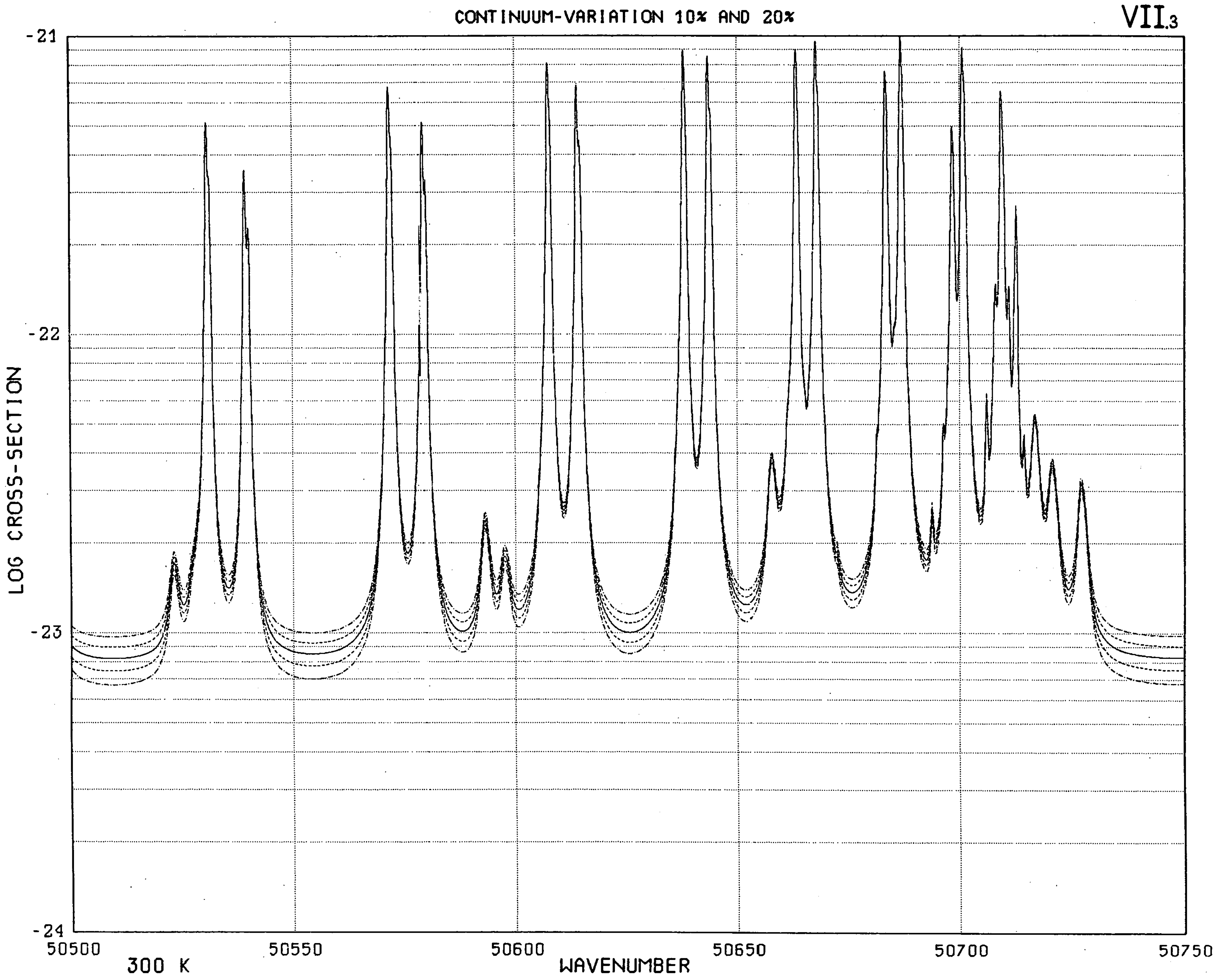

WITH AND WITHOUT CONTINUUM
VI.10
-21
-22
-23
-24
-25
-26
LOG CROSS-SECTION
50250
50300
50350
50400
50450
50500
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
50500 - 50750 cm^{-1}

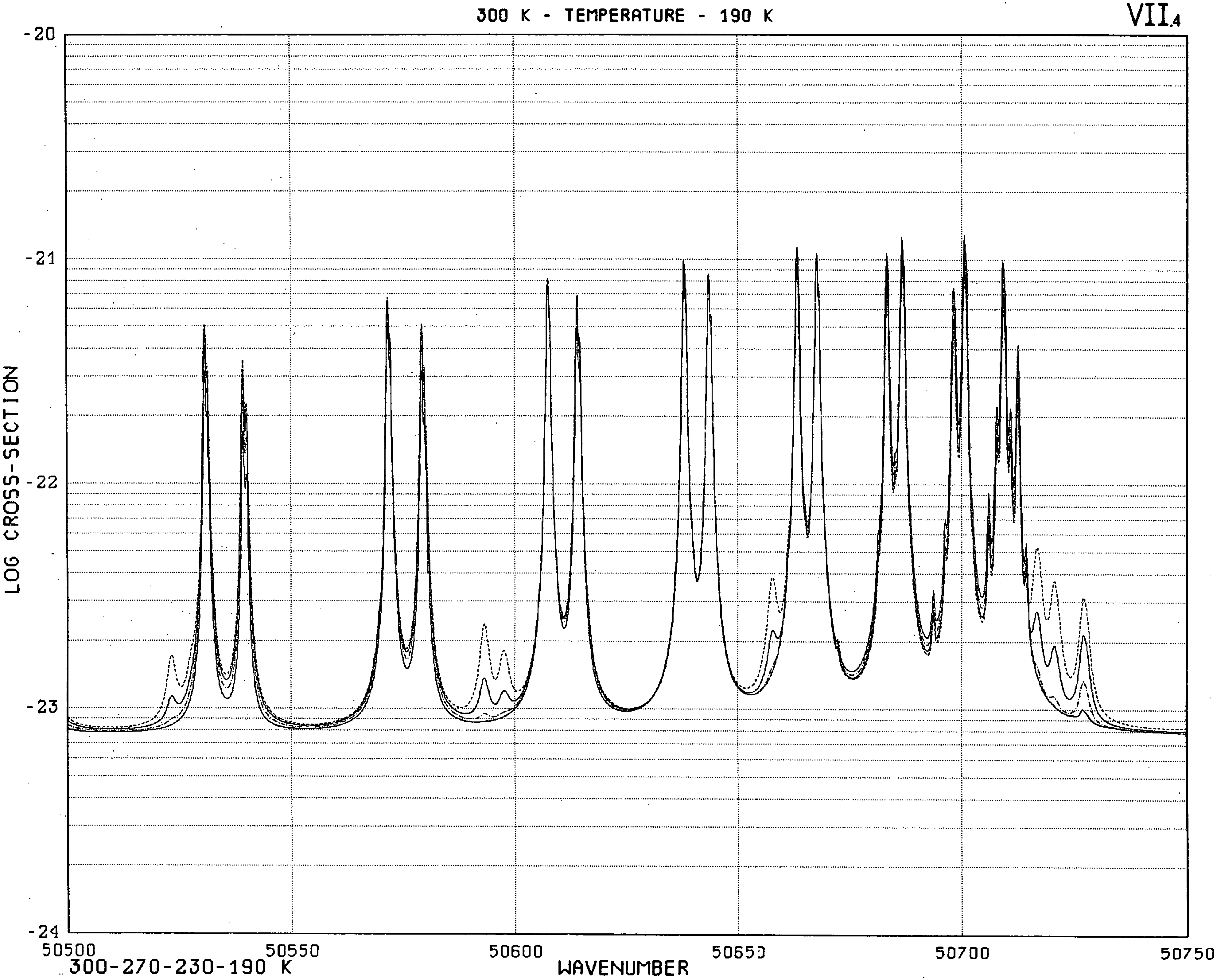
v	λ	band	v	λ	band
50500					
50522.9	1979.30	5-1 P25	50663.3	1973.82	2-0 P 7
50523.0	1979.29	5-1 P25	50663.6	1973.80	2-0 P 7
50523.6	1979.27	5-1 P25	50667.7	1973.64	2-0 R 9
50527.4	1979.13	5-1 R27	50667.7	1973.64	2-0 R 9
50527.7	1979.11	5-1 R27	50668.3	1973.62	2-0 R 9
50528.5	1979.08	5-1 R27	50683.3	1973.04	2-0 P 5
50530.7	1978.99	2-0 P15	50683.4	1973.03	2-0 P 5
50530.7	1978.99	2-0 P15	50683.7	1973.02	2-0 P 5
50531.3	1978.97	2-0 P15	50686.8	1972.90	2-0 R 7
50539.2	1978.66	2-0 R17	50686.8	1972.90	2-0 R 7
50539.3	1978.66	2-0 R17	50687.3	1972.88	2-0 R 7
50540.1	1978.63	2-0 R17	50698.1	1972.46	2-0 P 3
50550			50698.3	1972.45	2-0 P 3
50571.7	1977.39	2-0 P13	50698.6	1972.44	2-0 P 3
50571.7	1977.39	2-0 P13	50700		
50572.2	1977.37	2-0 P13	50700.6	1972.37	2-0 R 5
50579.2	1977.10	2-0 R15	50700.6	1972.36	2-0 R 5
50579.3	1977.09	2-0 R15	50701.1	1972.35	2-0 R 5
50580.0	1977.07	2-0 R15	50707.9	1972.08	2-0 P 1
50593.0	1976.56	5-1 P23	50709.1	1972.03	2-0 R 3
50593.1	1976.55	5-1 P23	50709.3	1972.03	2-0 R 3
50593.6	1976.53	5-1 P23	50709.7	1972.01	2-0 R 3
50597.2	1976.39	5-1 R25	50710.9	1971.96	2-0 Q 1
50597.5	1976.38	5-1 R25	50712.5	1971.90	2-0 R 1
50598.2	1976.35	5-1 R25	50712.6	1971.90	2-0 R 1
50600			50716.7	1971.74	5-1 P19
50607.4	1976.00	2-0 P11	50716.7	1971.74	5-1 P19
50607.4	1975.99	2-0 P11	50717.2	1971.72	5-1 P19
50607.9	1975.98	2-0 P11	50720.4	1971.59	5-1 R21
50613.9	1975.74	2-0 R13	50720.6	1971.59	5-1 R21
50614.0	1975.74	2-0 R13	50721.2	1971.56	5-1 R21
50614.6	1975.71	2-0 R13	50726.9	1971.34	3-0 P29
50637.9	1974.81	2-0 P 9	50727.1	1971.33	3-0 P29
50638.0	1974.80	2-0 P 9	50727.9	1971.30	3-0 P29
50638.4	1974.79	2-0 P 9			
50643.4	1974.59	2-0 R11			
50643.5	1974.59	2-0 R11			
50644.1	1974.57	2-0 R11			
50650					
50657.6	1974.04	5-1 P21			
50657.6	1974.04	5-1 P21			
50658.1	1974.02	5-1 P21			
50661.6	1973.88	5-1 R23			
50661.8	1973.87	5-1 R23			
50662.5	1973.85	5-1 R23			
50663.2	1973.82	2-0 P 7			

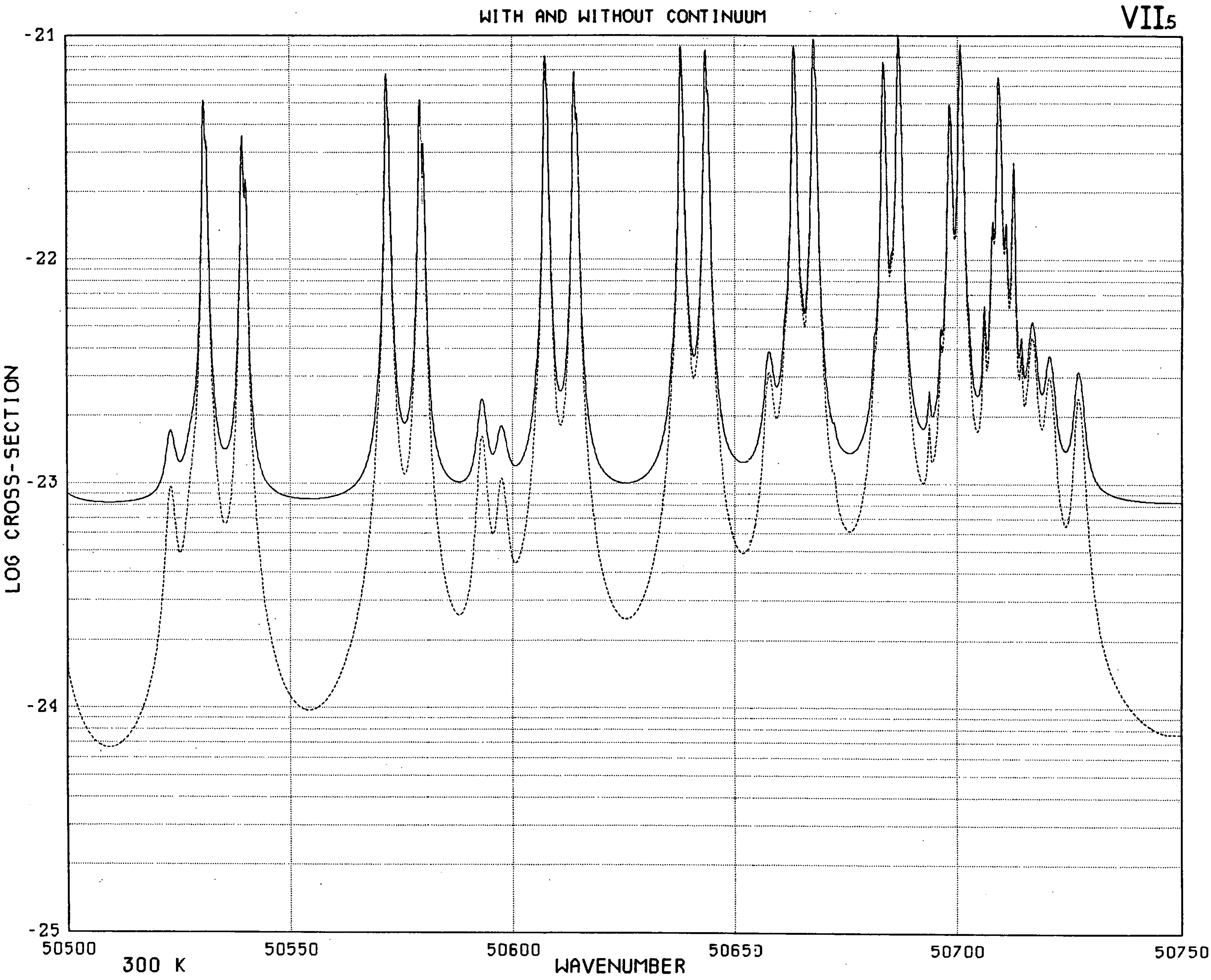

IDENTIFICATION
300K
LABORATORY
CALCULATION
2-0 BAND
P15 R17
P13 R15
P11 R13
P9 R11
P7 R9
P5 R7
P3 R5
P1
R3
R1
5-1 BAND
P25
P23 R25
P21
P19 R21
3-0 BAND
P29
CROSS-SECTION
10
9
8
7
6
5
4
3
2
1.10⁻²²
0
WAVENUMBER
50500
50550
50600
50650
50700
50750


CROSS-SECTION
2-0 BAND
P15 R17
P13 R15
P11 R13
P9 R11
P7 R9
P5 R7
P3 R5
P1 R3
R1
5-1 BAND
P19
R21
3-0BAND
P29
P25
P23 R25
P21
CONTINUUM=7.53x10-24cm2
(50500 cm-1)
----- LABORATORY
—— CALCULATION
LOG SIGMA(O2)
-21
-22
-23
-24
50500
50550
50600
50650
50700
50750
300 K
WAVENUMBER



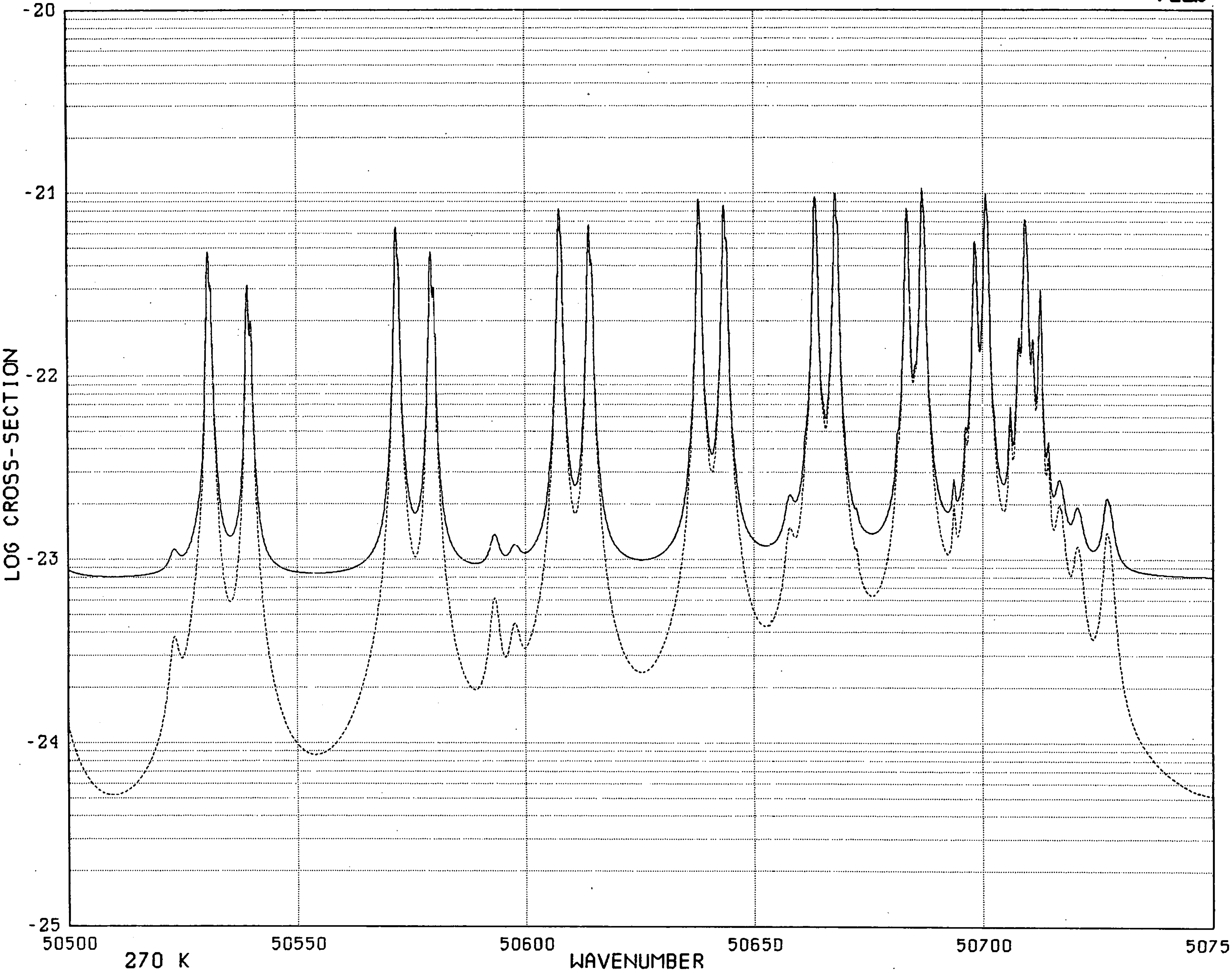
VII.3
CONTINUUM-VARIATION 10% AND 20%
LOG CROSS-SECTION
-21
-22
-23
-24
50500
50550
50600
50650
50700
50750
300 K
WAVENUMBER


300 K - TEMPERATURE - 190 K
-20
-21
-22
-23
-24
LOG CROSS-SECTION
50500
50550
50600
50650
50700
50750
300-270-230-190 K
WAVENUMBER

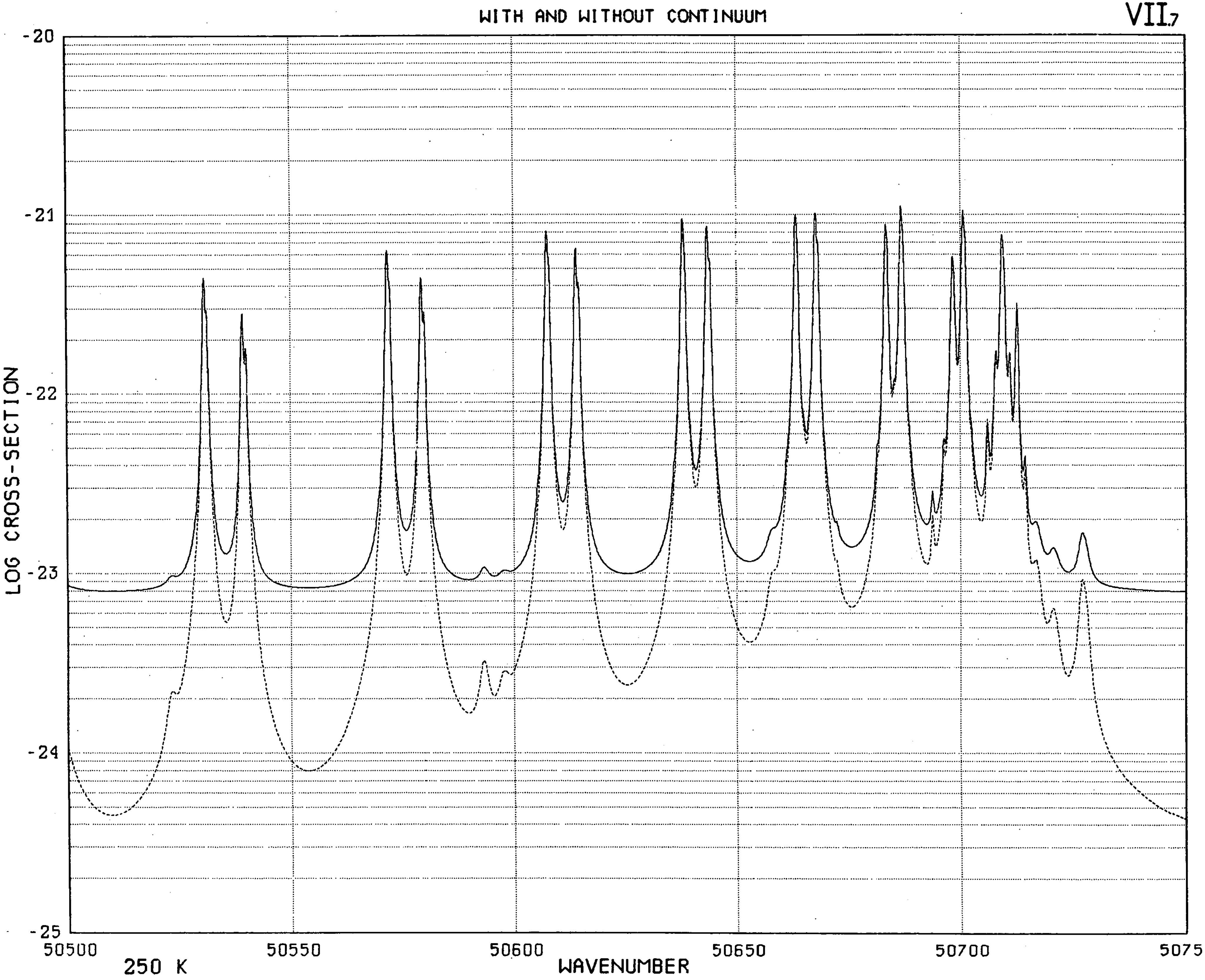


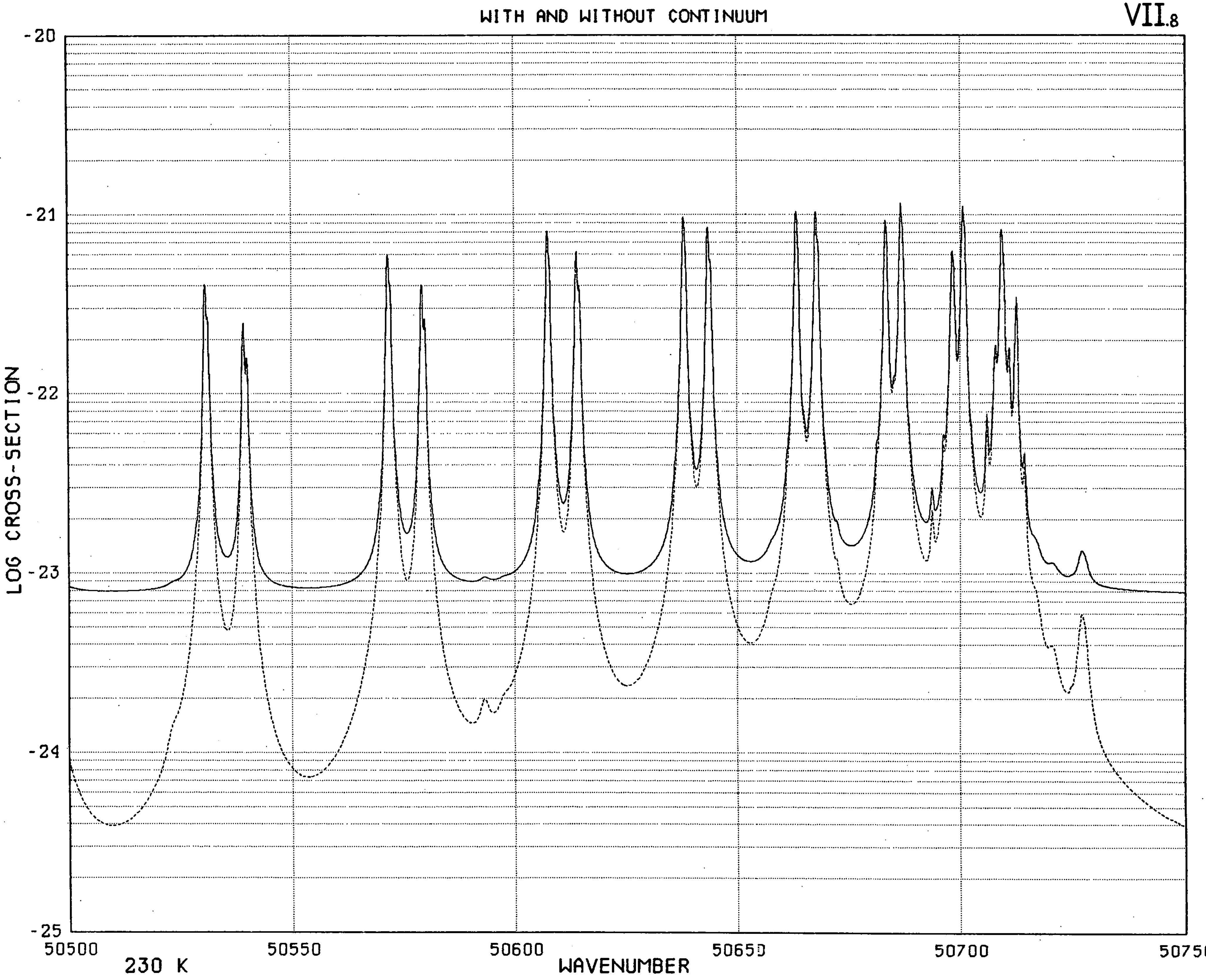
WITH AND WITHOUT CONTINUUM
VII5
LOG CROSS-SECTION
-21
-22
-23
-24
-25
50500
50550
50600
50650
50700
50750
300 K
WAVENUMBER

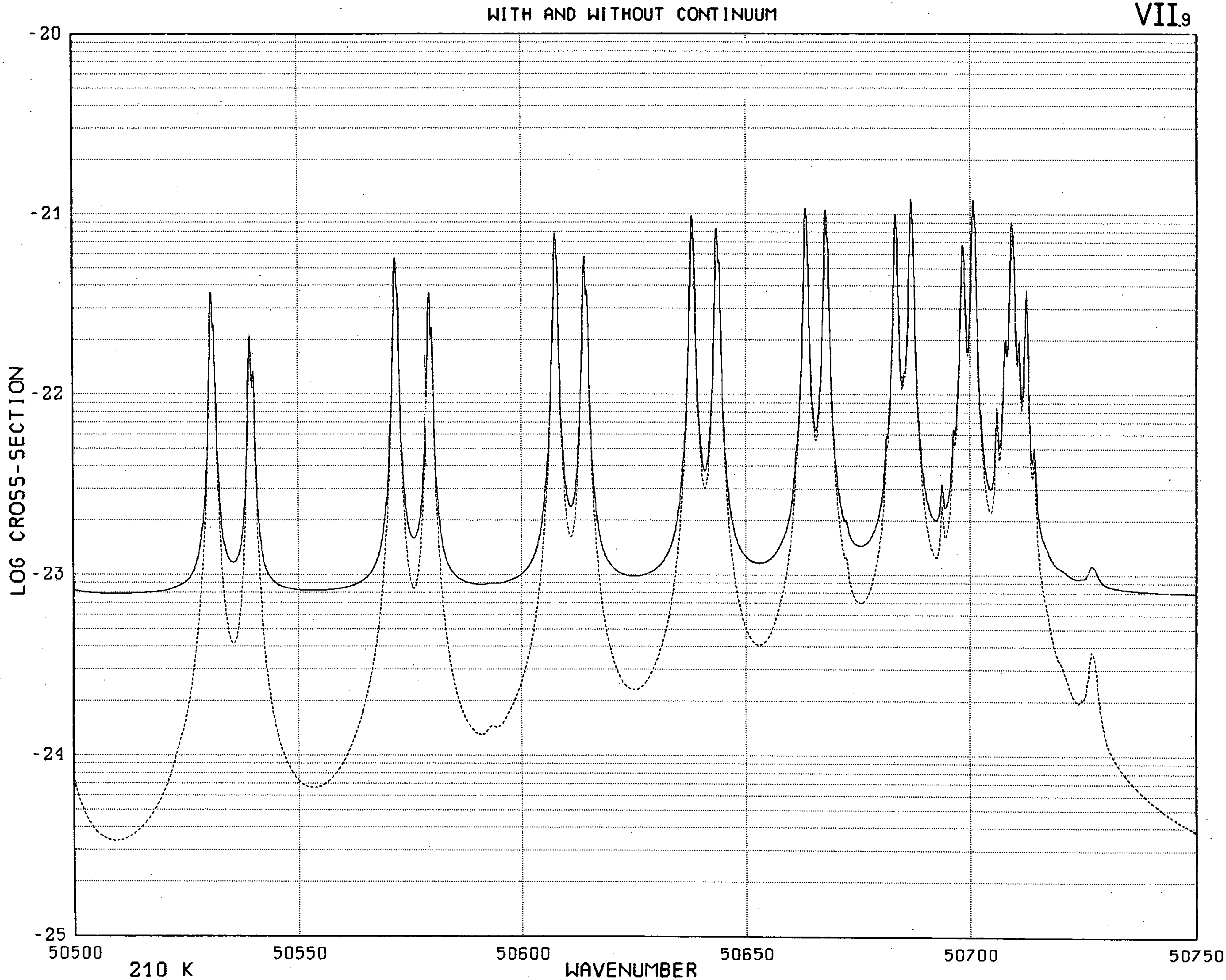
WITH AND WITHOUT CONTINUUM

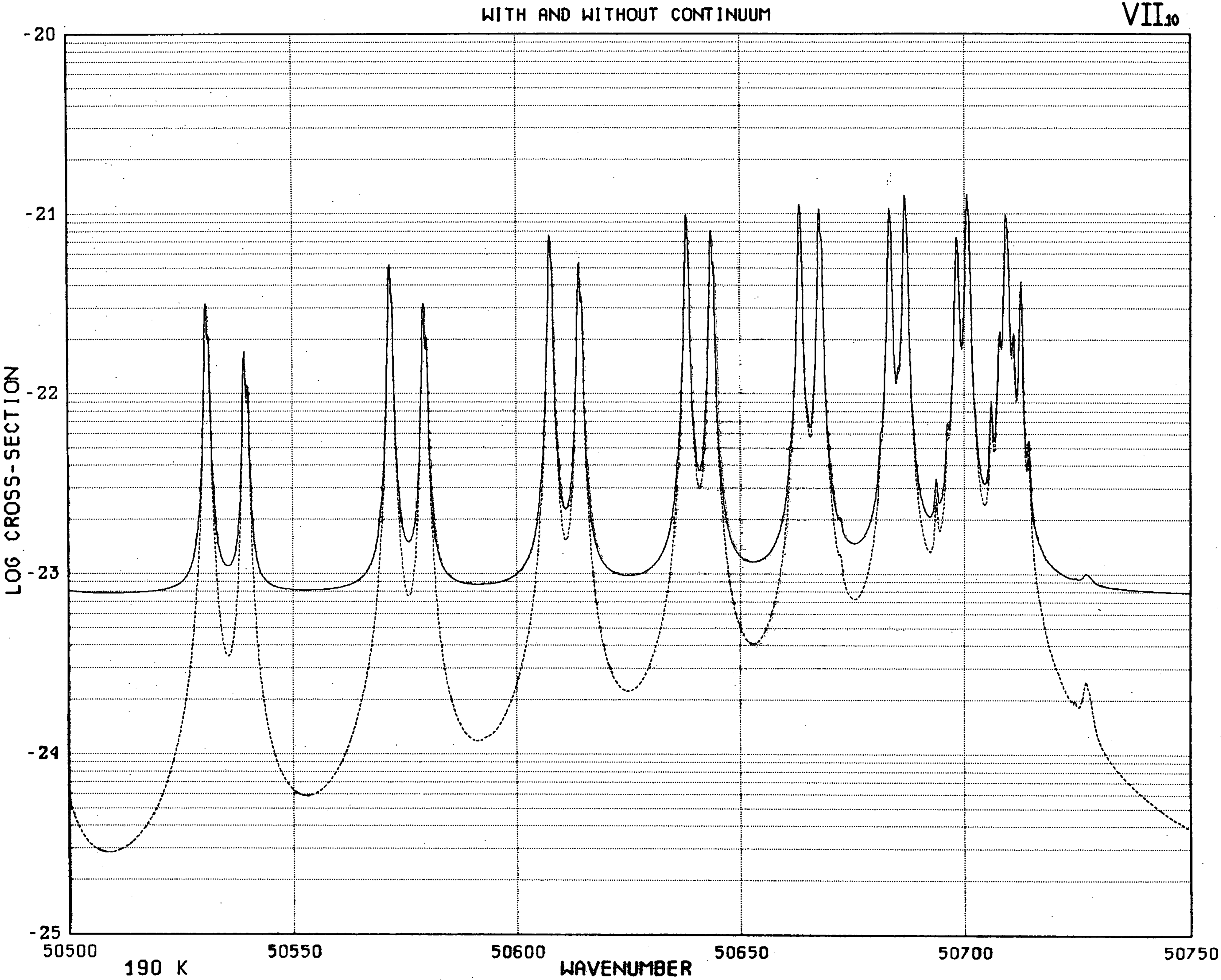


270 K


WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50500
50550
50600
50650
50700
50750
WAVENUMBER
250 K

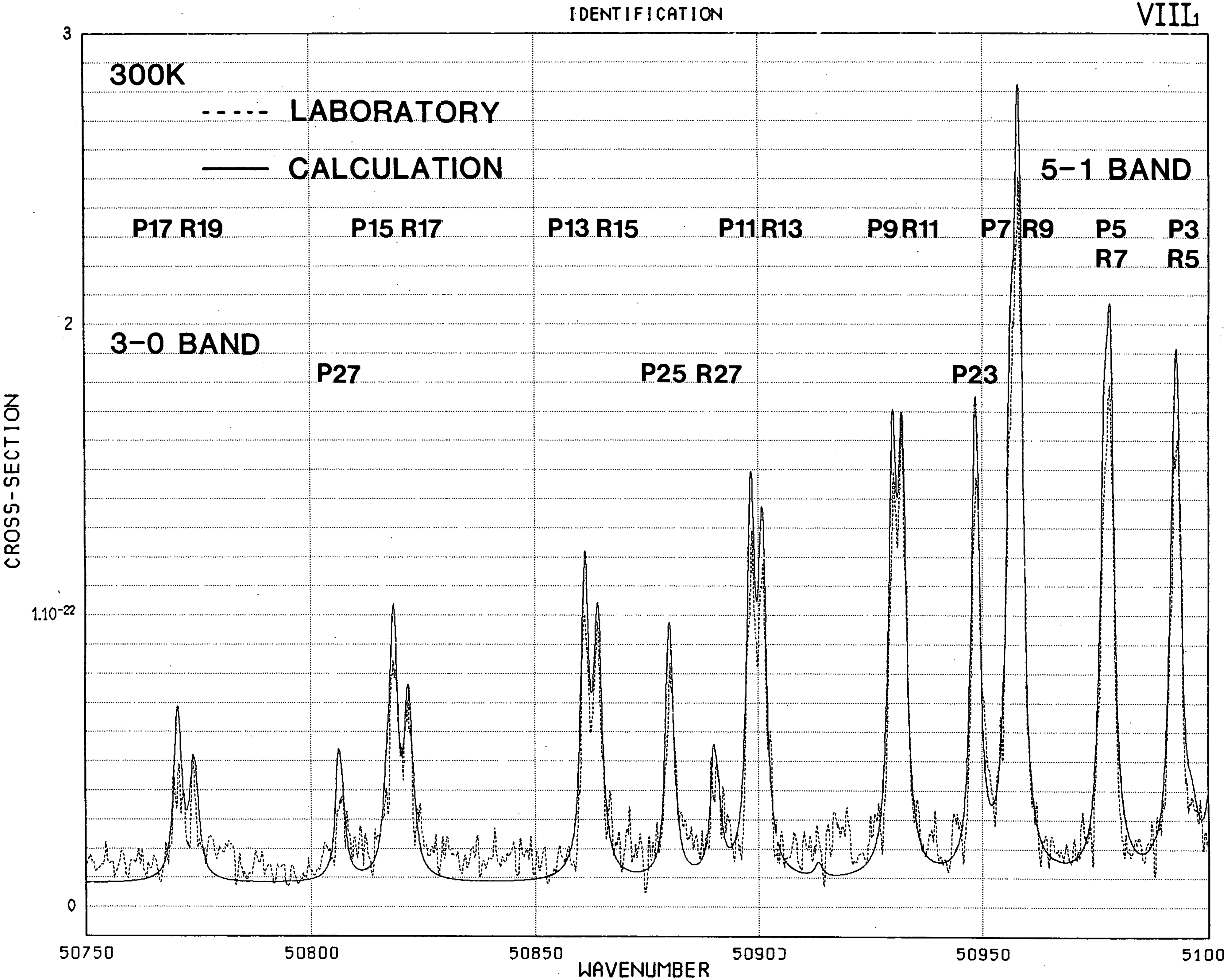

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-20
-21
-22
-23
-24
-25
50500
50550
50600
50650
50700
50750
230 K
WAVENUMBER

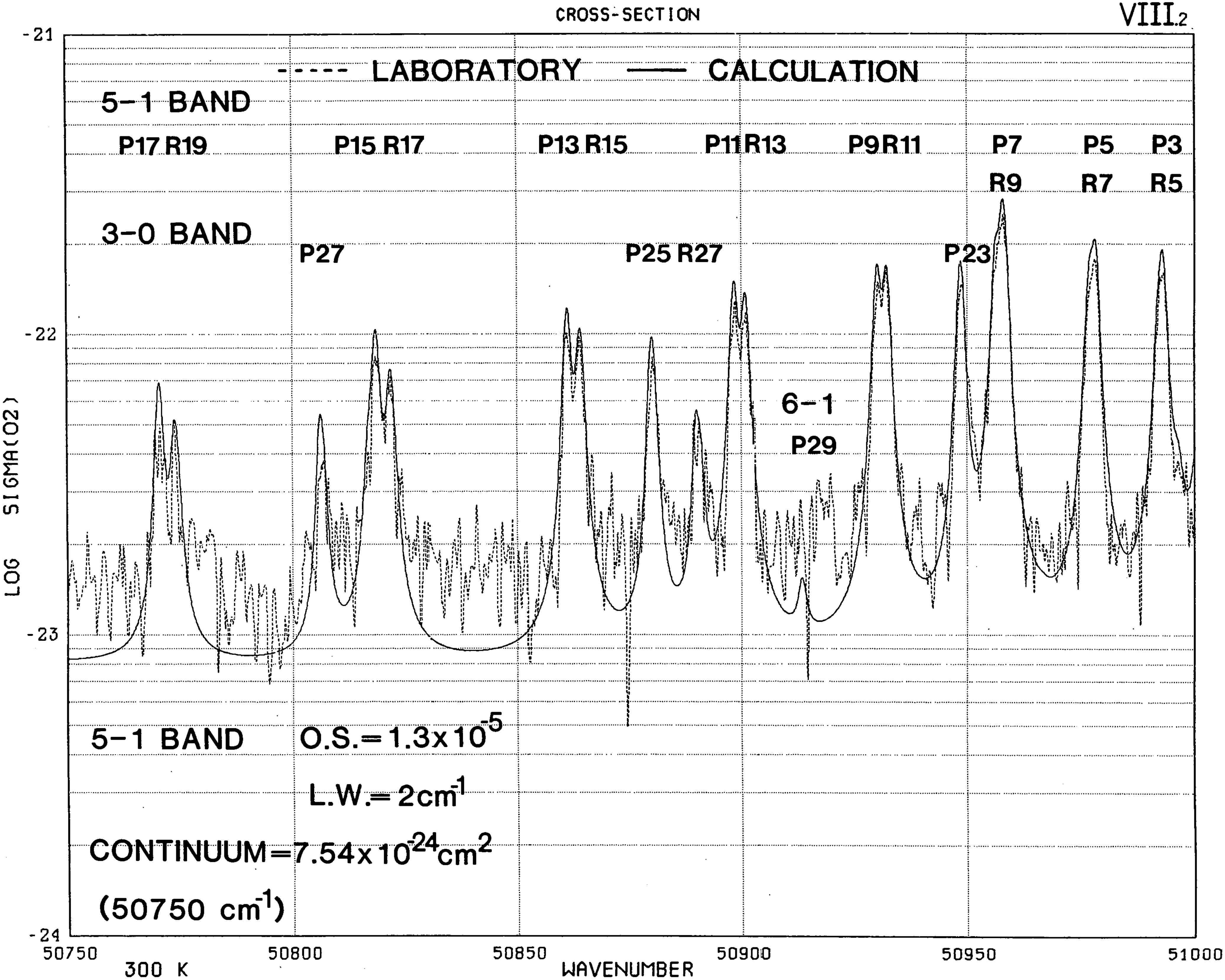

WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50500
50550
50600
50650
50700
50750
WAVENUMBER
210 K

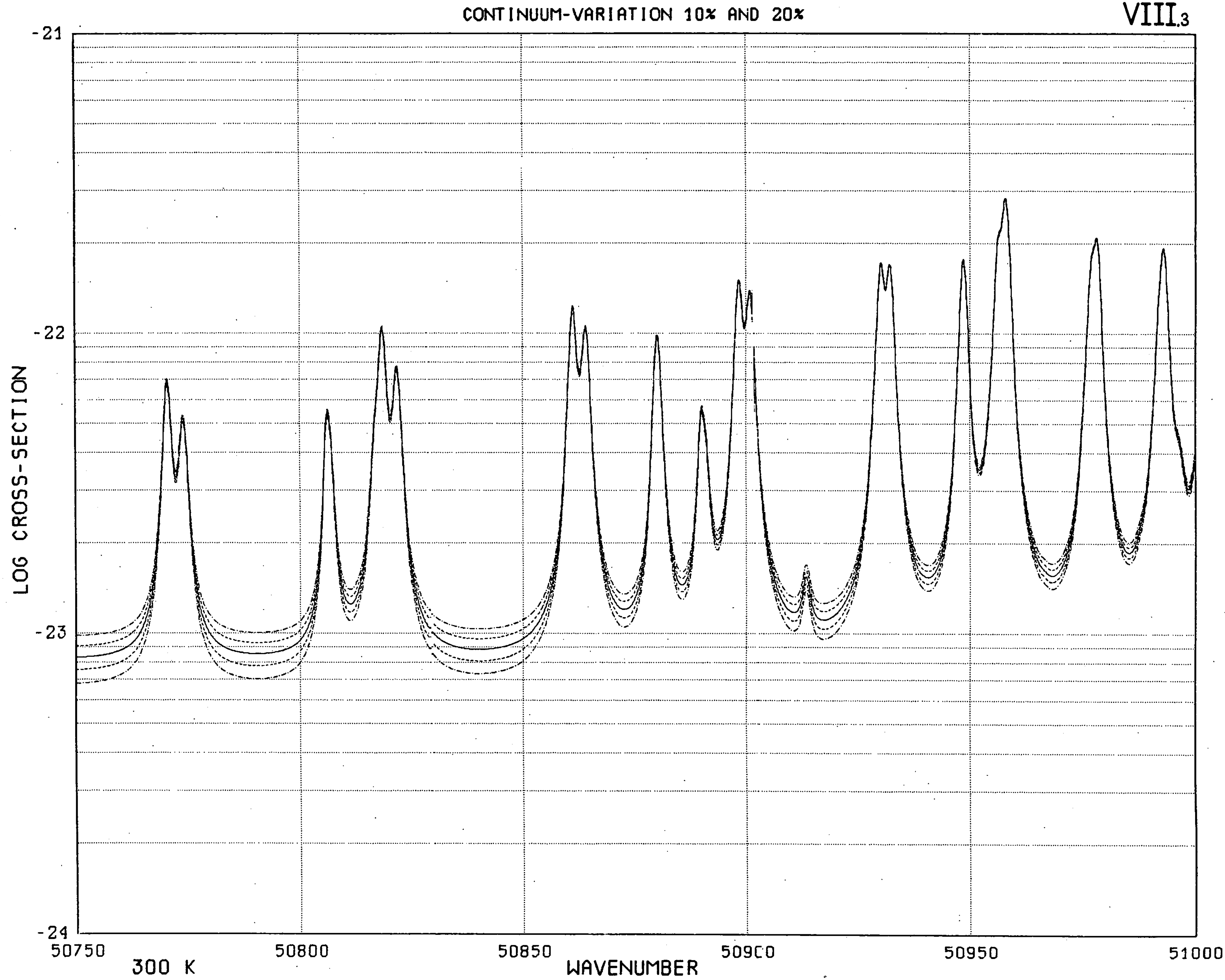

WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50500
50550
50600
50650
50700
50750
190 K
WAVENUMBER

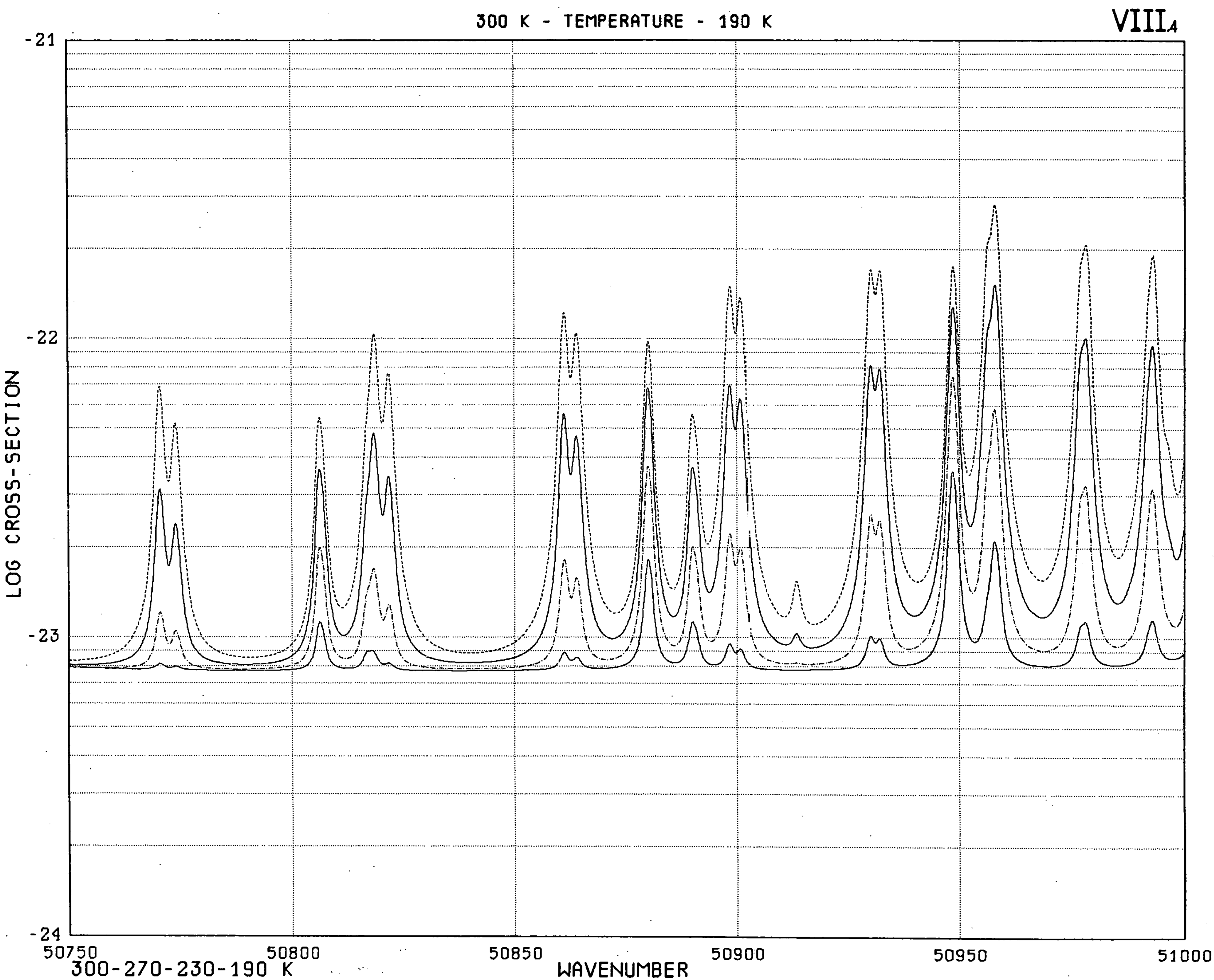
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
50750 - 51000 cm^{-1}

v	λ	band
50750		
50770.3	1969.66	5-1 P17
50770.3	1969.66	5-1 P17
50770.8	1969.64	5-1 P17
50773.8	1969.52	5-1 R19
50773.9	1969.52	5-1 R19
50774.5	1969.49	5-1 R19
50800		
50806.0	1968.27	3-0 P27
50806.2	1968.26	3-0 P27
50806.9	1968.24	3-0 P27
50816.6	1967.86	3-0 R29
50817.0	1967.85	3-0 R29
50817.9	1967.81	3-0 R29
50818.4	1967.79	5-1 P15
50818.4	1967.79	5-1 P15
50818.8	1967.77	5-1 P15
50821.6	1967.67	5-1 R17
50821.7	1967.66	5-1 R17
50822.2	1967.64	5-1 R17
50850		
50861.0	1966.14	5-1 P13
50861.1	1966.14	5-1 P13
50861.5	1966.13	5-1 P13
50863.9	1966.03	5-1 R15
50864.0	1966.03	5-1 R15
50864.5	1966.01	5-1 R15
50879.8	1965.42	3-0 P25
50880.0	1965.41	3-0 P25
50880.6	1965.38	3-0 P25
50889.8	1965.03	3-0 R27
50890.1	1965.02	3-0 R27
50891.0	1964.99	3-0 R27
50898.2	1964.71	5-1 P11
50898.3	1964.70	5-1 P11
50898.6	1964.69	5-1 P11
50900		
50900.7	1964.61	5-1 R13
50900.8	1964.61	5-1 R13
50901.2	1964.59	5-1 R13
50913.2	1964.13	6-1 P29
50913.3	1964.12	6-1 P29
50913.8	1964.10	6-1 P29
50929.9	1963.48	5-1 P 9
50930.0	1963.48	5-1 P 9
50930.3	1963.47	5-1 P 9
50932.0	1963.40	5-1 R11
50932.0	1963.40	5-1 R11
50932.5	1963.38	5-1 R11
50948.3	1962.77	3-0 P23
50948.4	1962.77	3-0 P23
50949.0	1962.74	3-0 P23
50950		
50956.1	1962.47	5-1 P 7
50956.2	1962.47	5-1 P 7
50956.5	1962.46	5-1 P 7
50957.6	1962.42	3-0 R25
50957.9	1962.41	3-0 R25
50957.9	1962.40	5-1 R 9
50958.3	1962.39	5-1 R 9
50958.7	1962.37	3-0 R25
50976.8	1961.68	5-1 P 5
50976.9	1961.67	5-1 P 5
50977.2	1961.66	5-1 P 5
50978.2	1961.62	5-1 R 7
50978.3	1961.62	5-1 R 7
50978.6	1961.61	5-1 R 7
50992.1	1961.09	5-1 P 3
50992.2	1961.09	5-1 P 3
50992.6	1961.07	5-1 P 3
50993.0	1961.05	5-1 R 5
50993.1	1961.05	5-1 R 5
50993.5	1961.04	5-1 R 5
50996.1	1960.93	6-1 P27
50996.3	1960.93	6-1 P27
50996.8	1960.91	6-1 P27
50996.8	1960.91	6-1 R29
50997.1	1960.90	6-1 R29
50997.7	1960.87	6-1 R29

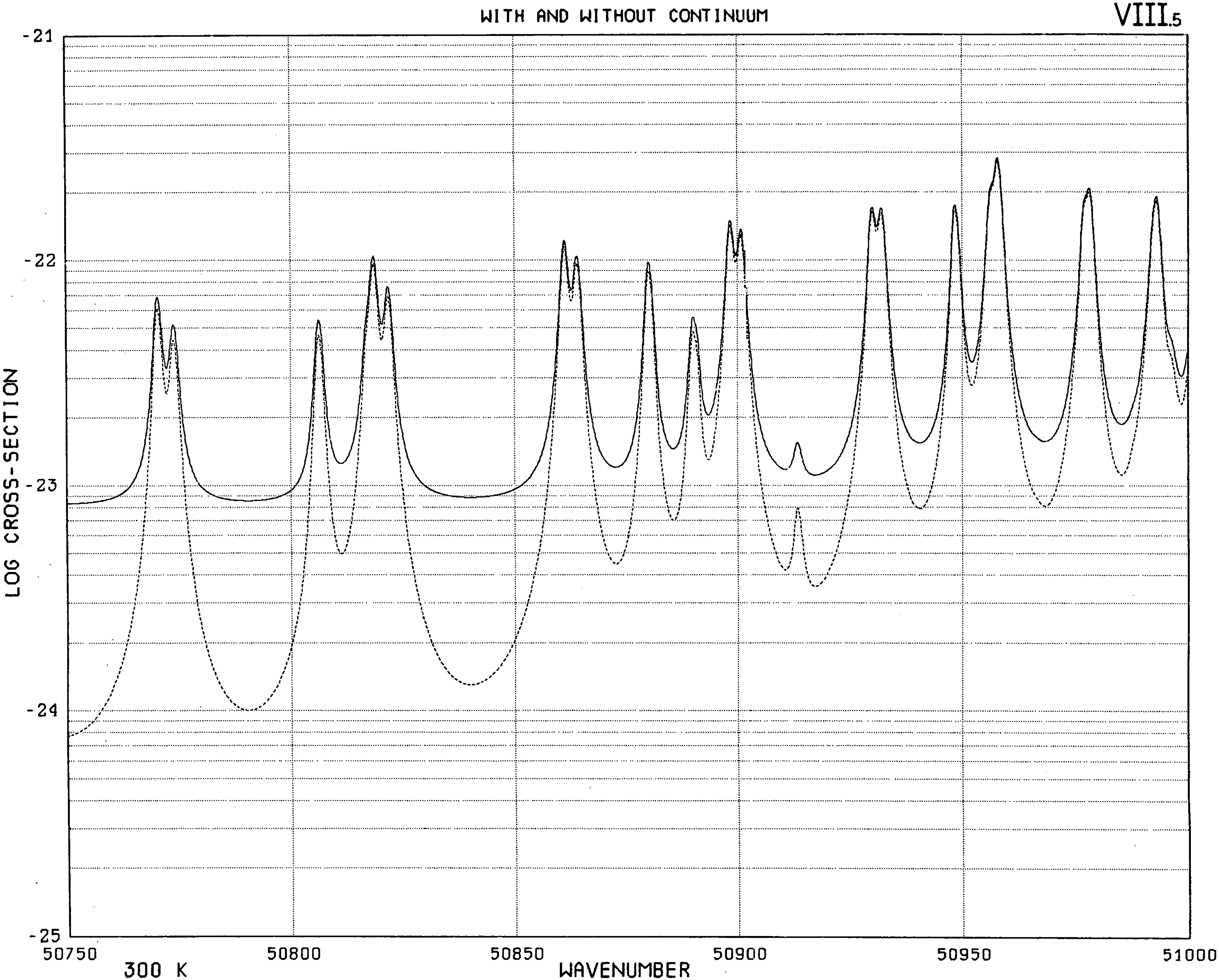

IDENTIFICATION
VIII1
300K
LABORATORY
CALCULATION
5-1 BAND
P17 R19
P15 R17
P13 R15
P11 R13
P9 R11
P7 R9
P5
R7
P3
R5
3-0 BAND
P27
P25 R27
P23
3
2
1.10-22
0
CROSS-SECTION
50750
50800
50850
50900
50950
51000
WAVENUMBER

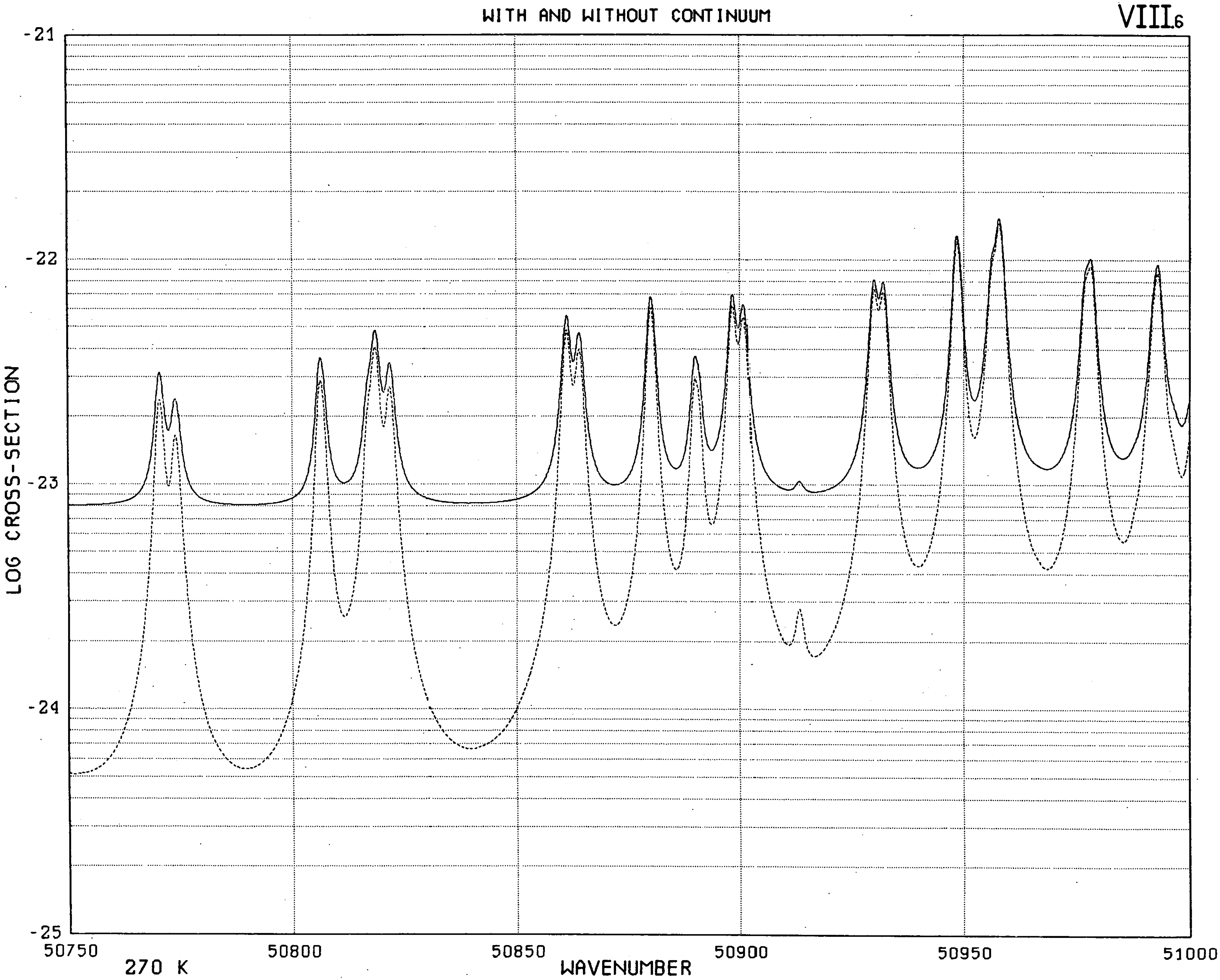

CROSS-SECTION
LABORATORY
CALCULATION
5-1 BAND
P17 R19
P15 R17
P13 R15
P11 R13
P9 R11
P7
R9
P5
R7
P3
R5
3-0 BAND
P27
P25 R27
P23
6-1
P29
5-1 BAND
O.S.= 1.3×10^{-5}
L.W.= $2 cm^{-1}$
CONTINUUM= $7.54 \times 10^{-24} cm^2$
($50750 cm^{-1}$)
LOG SIGMA(O2)
-21
-22
-23
-24
50750
50800
50850
50900
50950
51000
300 K
WAVENUMBER

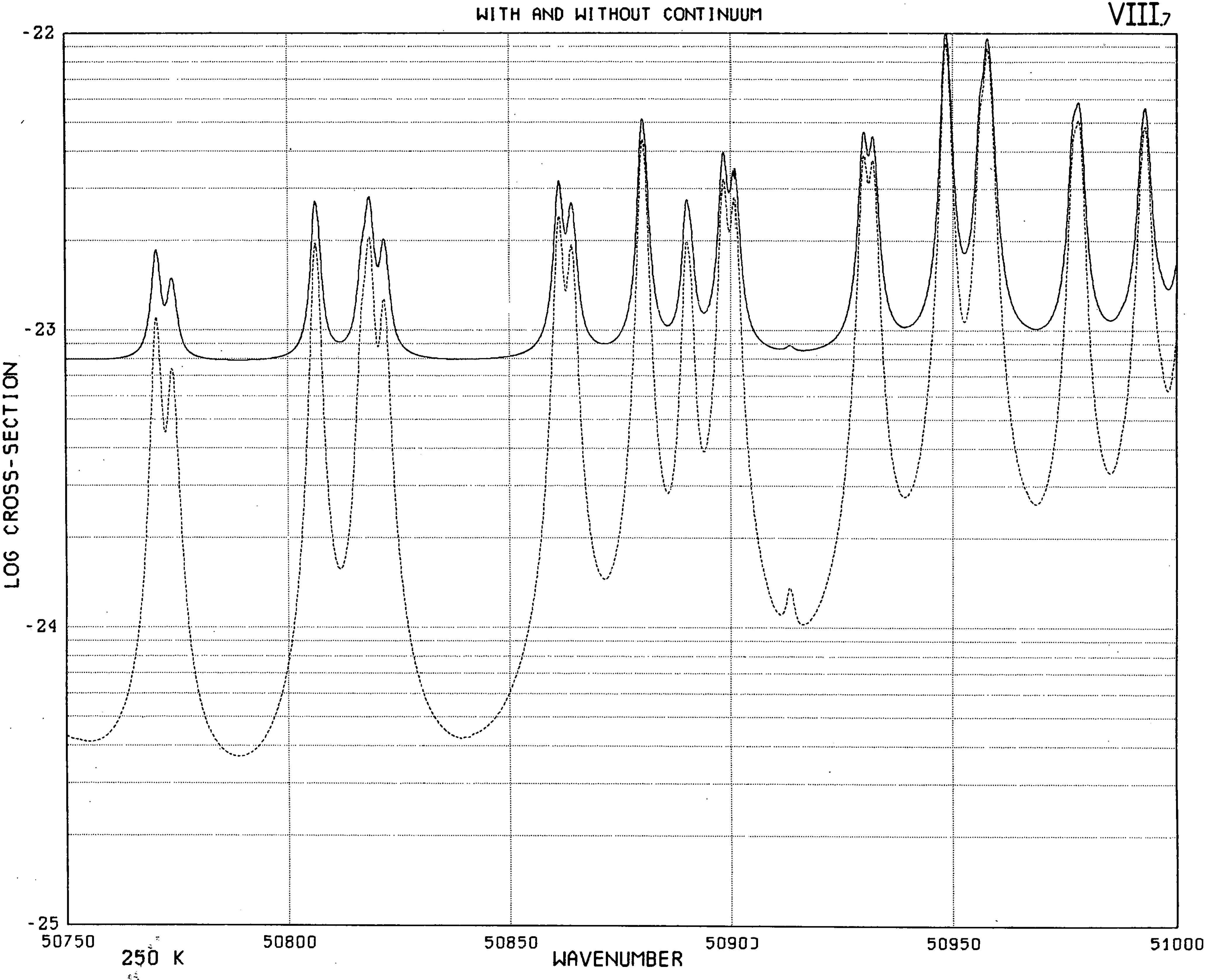

CONTINUUM-VARIATION 10% AND 20%
-21
-22
-23
-24
LOG CROSS-SECTION
50750
50800
50850
50900
50950
51000
300 K
WAVENUMBER

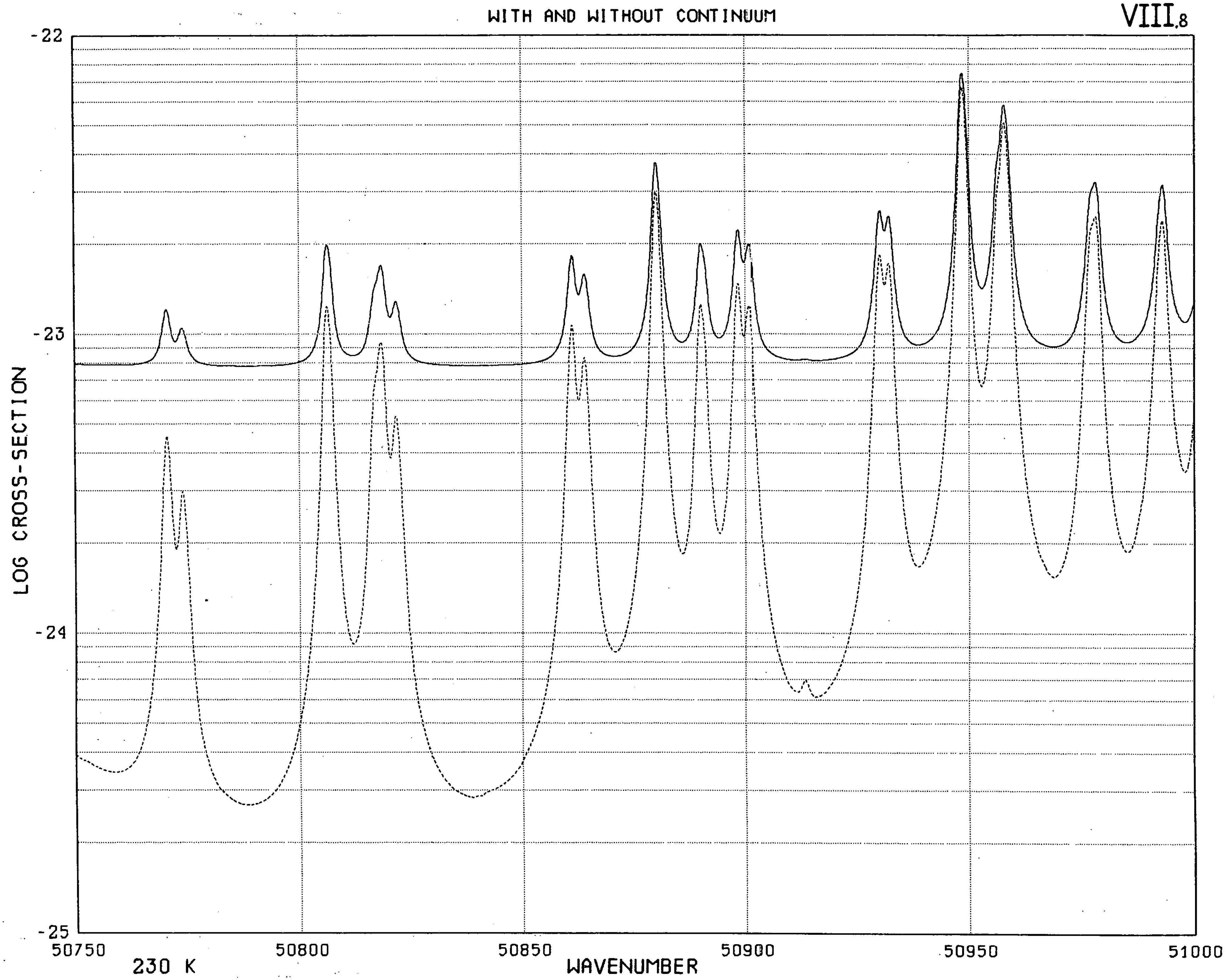


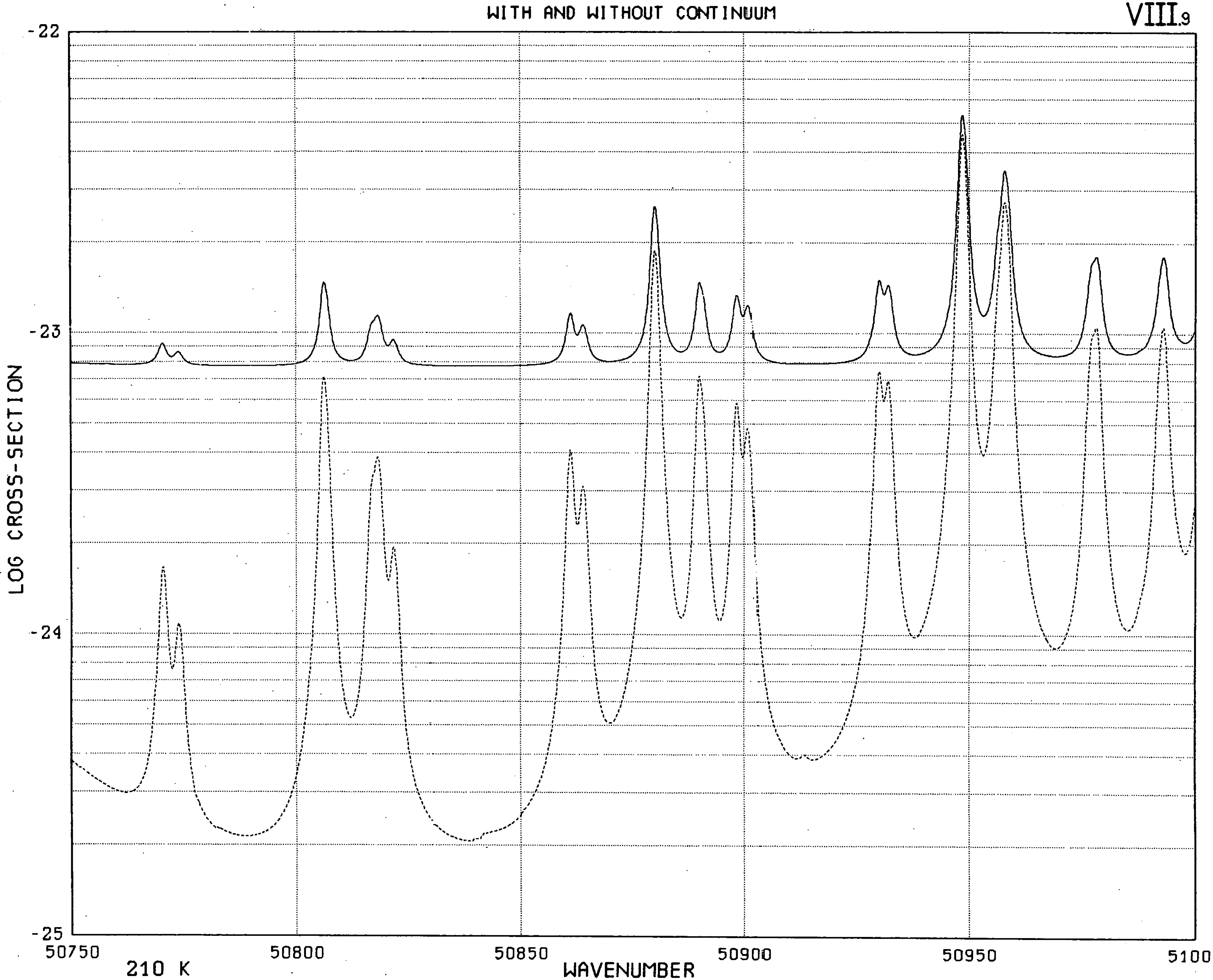
300 K - TEMPERATURE - 190 K
VIII4
-21
-22
-23
-24
LOG CROSS-SECTION
50750
50800
50850
50900
50950
51000
300-270-230-190 K
WAVENUMBER

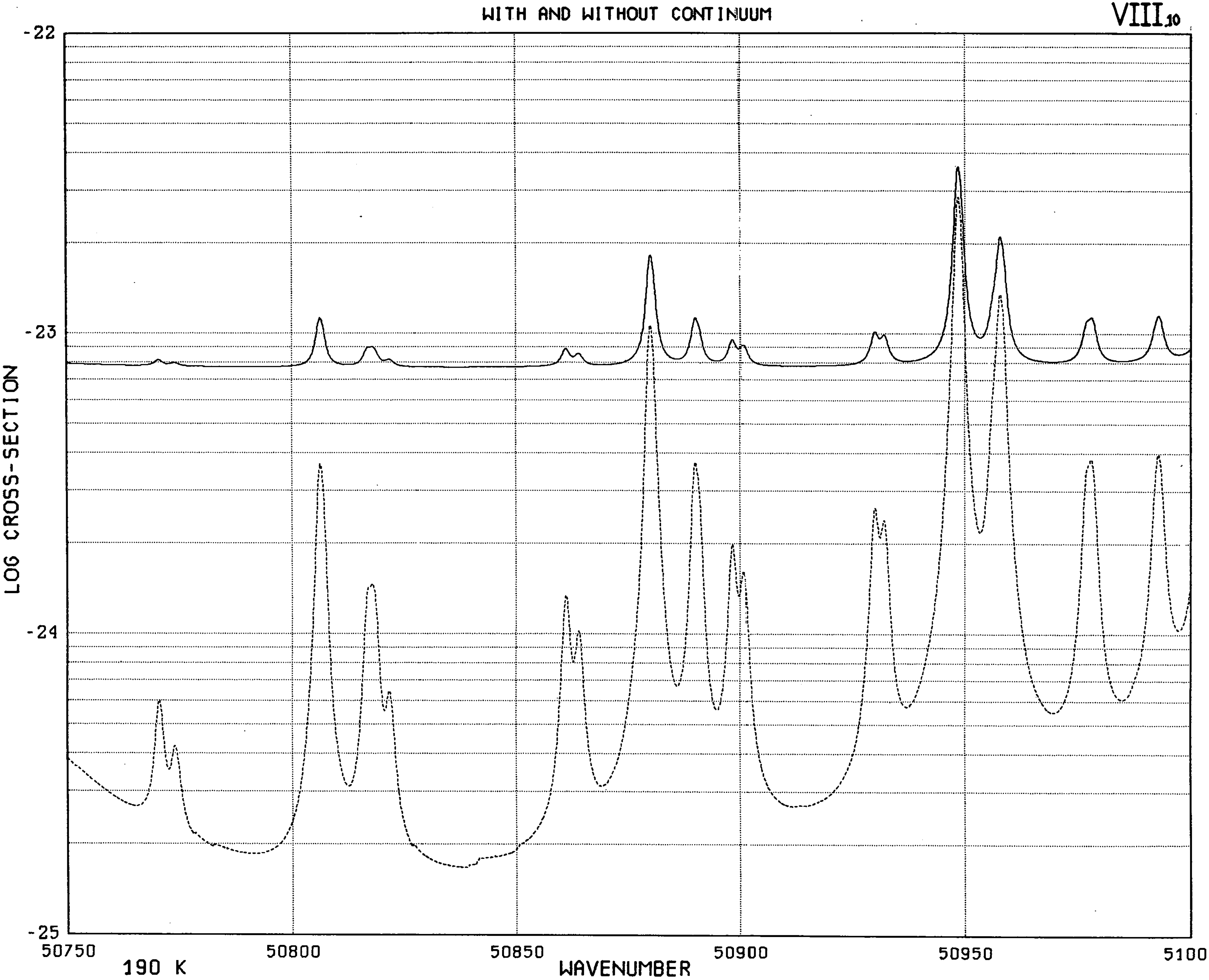

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-21
-22
-23
-24
-25
50750
50800
50850
50900
50950
51000
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
-25
LOG CROSS-SECTION
50750
50800
50850
50900
50950
51000
WAVENUMBER
270 K


WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
LOG CROSS-SECTION
50750
50800
50850
50900
50950
51000
WAVENUMBER
250 K

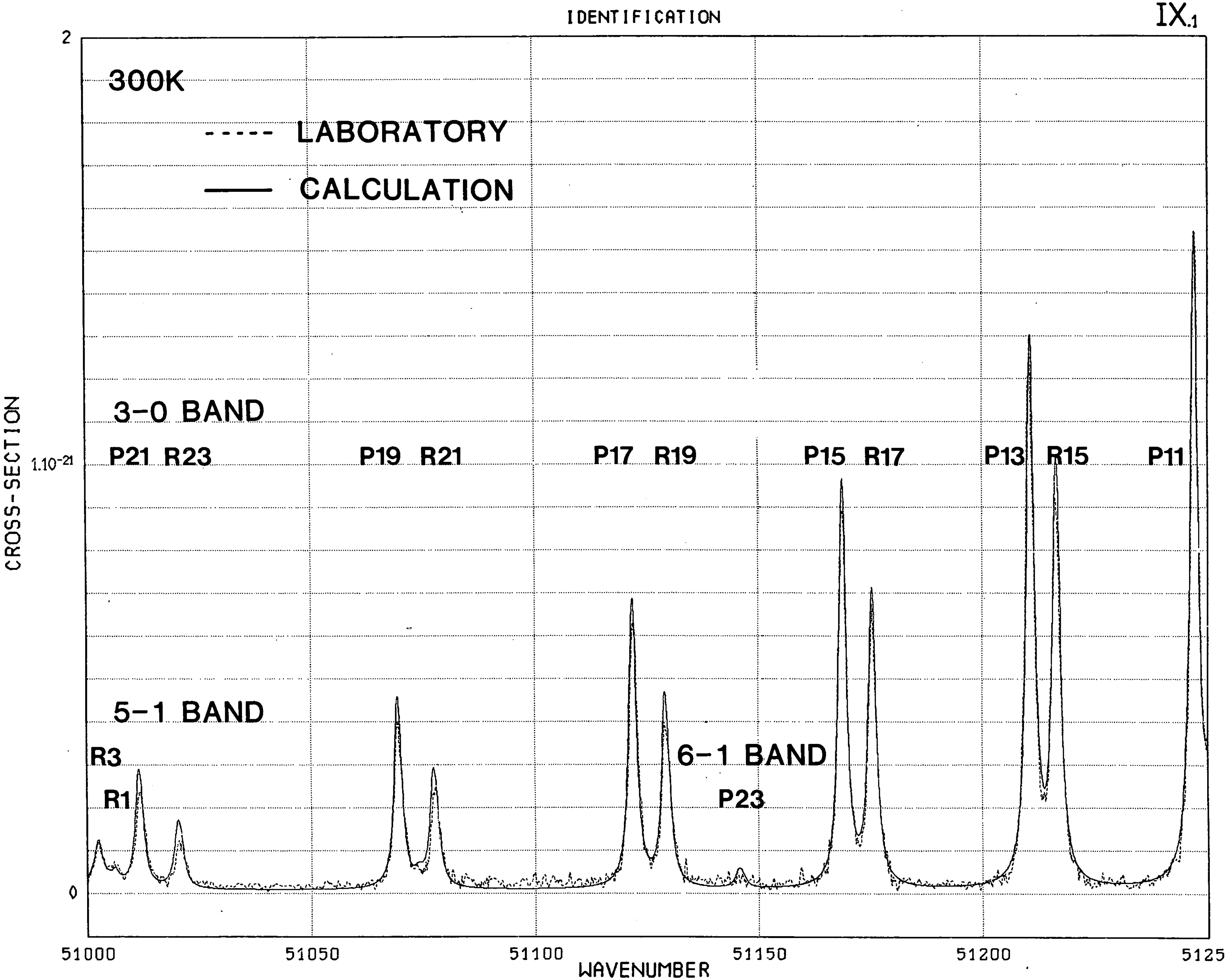

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-22
-23
-24
-25
50750
50800
50850
50900
50950
51000
WAVENUMBER
230 K

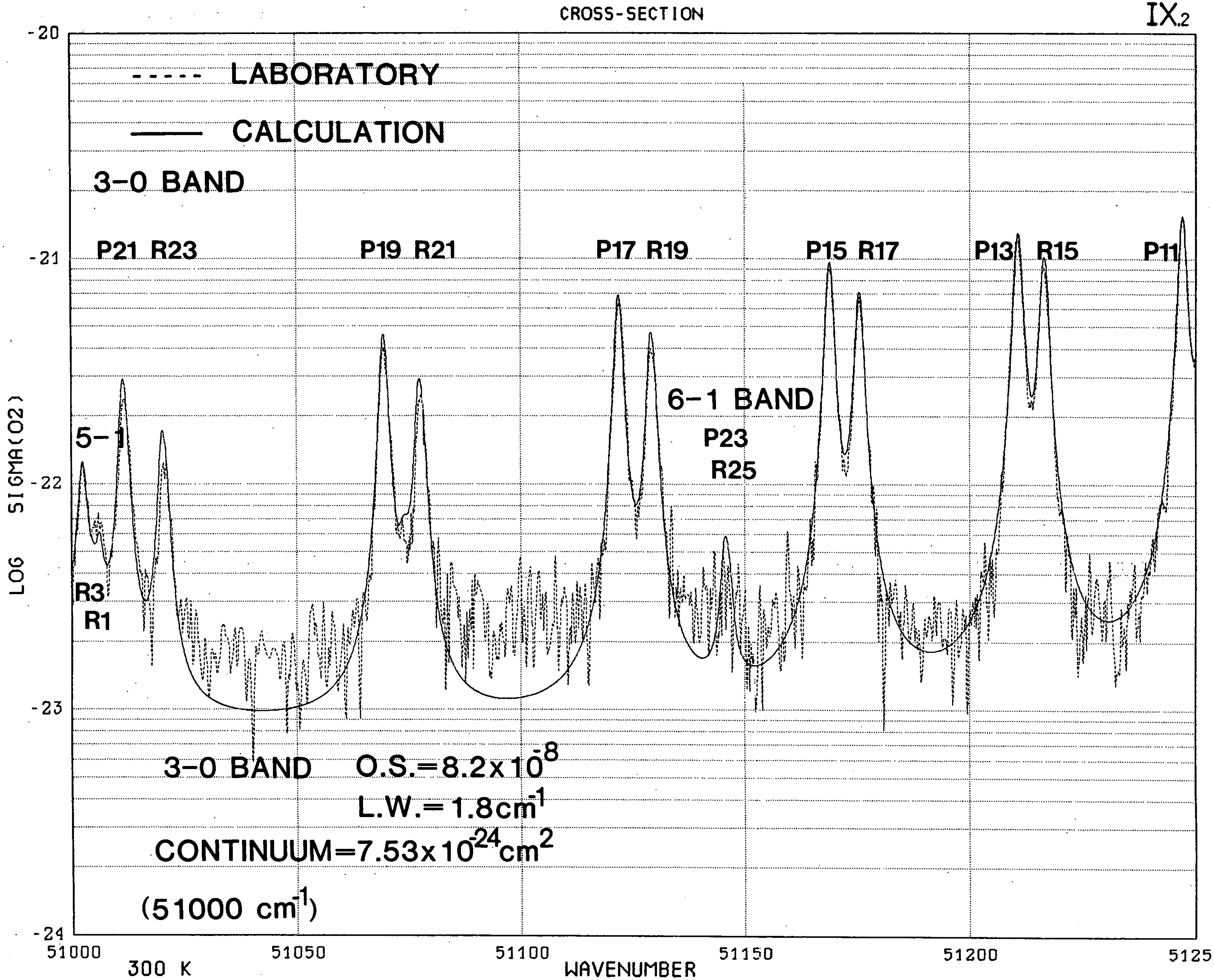

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-22
-23
-24
-25
50750
50800
50850
50900
50950
51000
WAVENUMBER
210 K

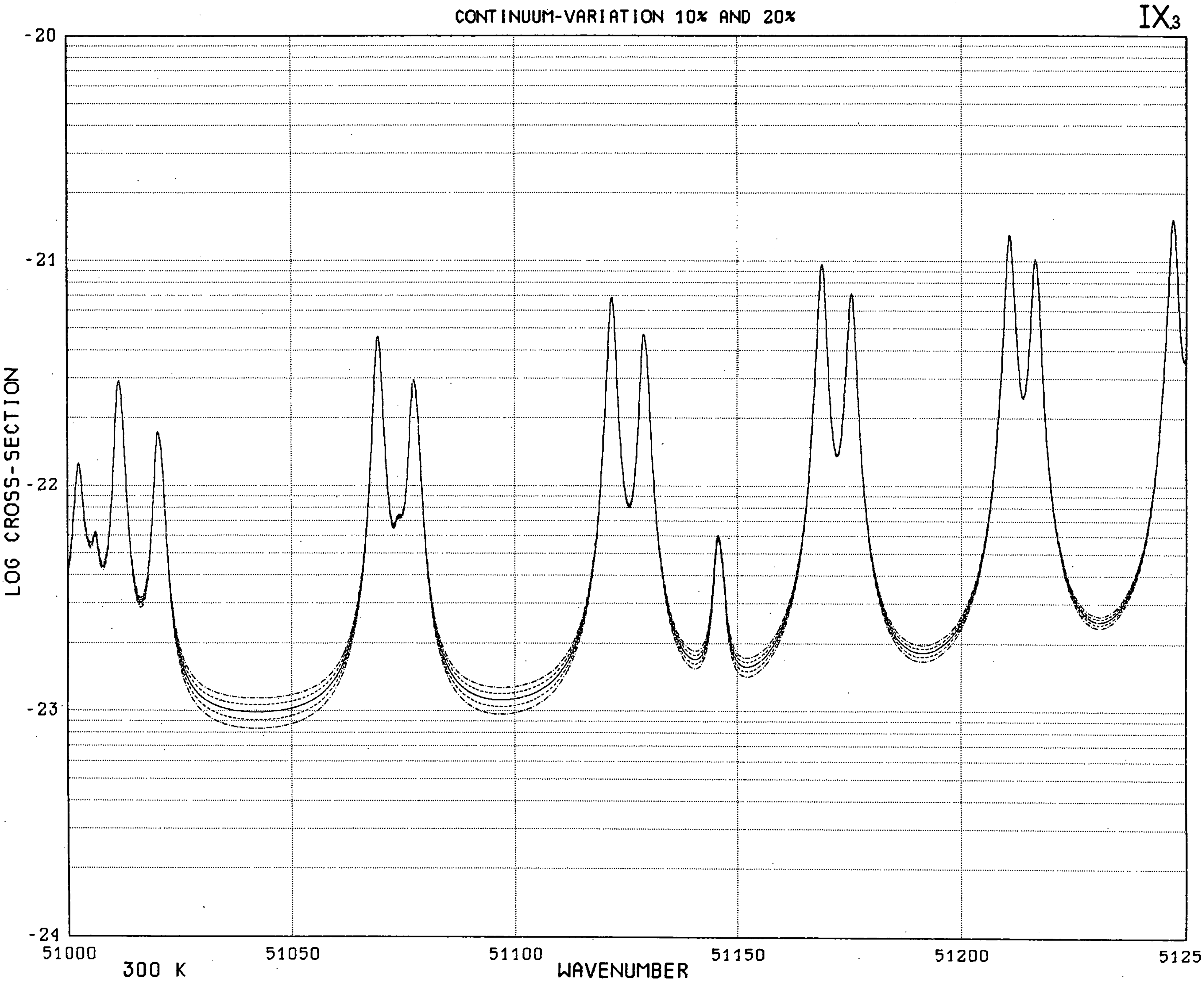

WITH AND WITHOUT CONTINUUM
-22
-23
-24
-25
LOG CROSS-SECTION
50750
50800
50850
50900
50950
51000
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
51000 - 51250 cm^{-1}

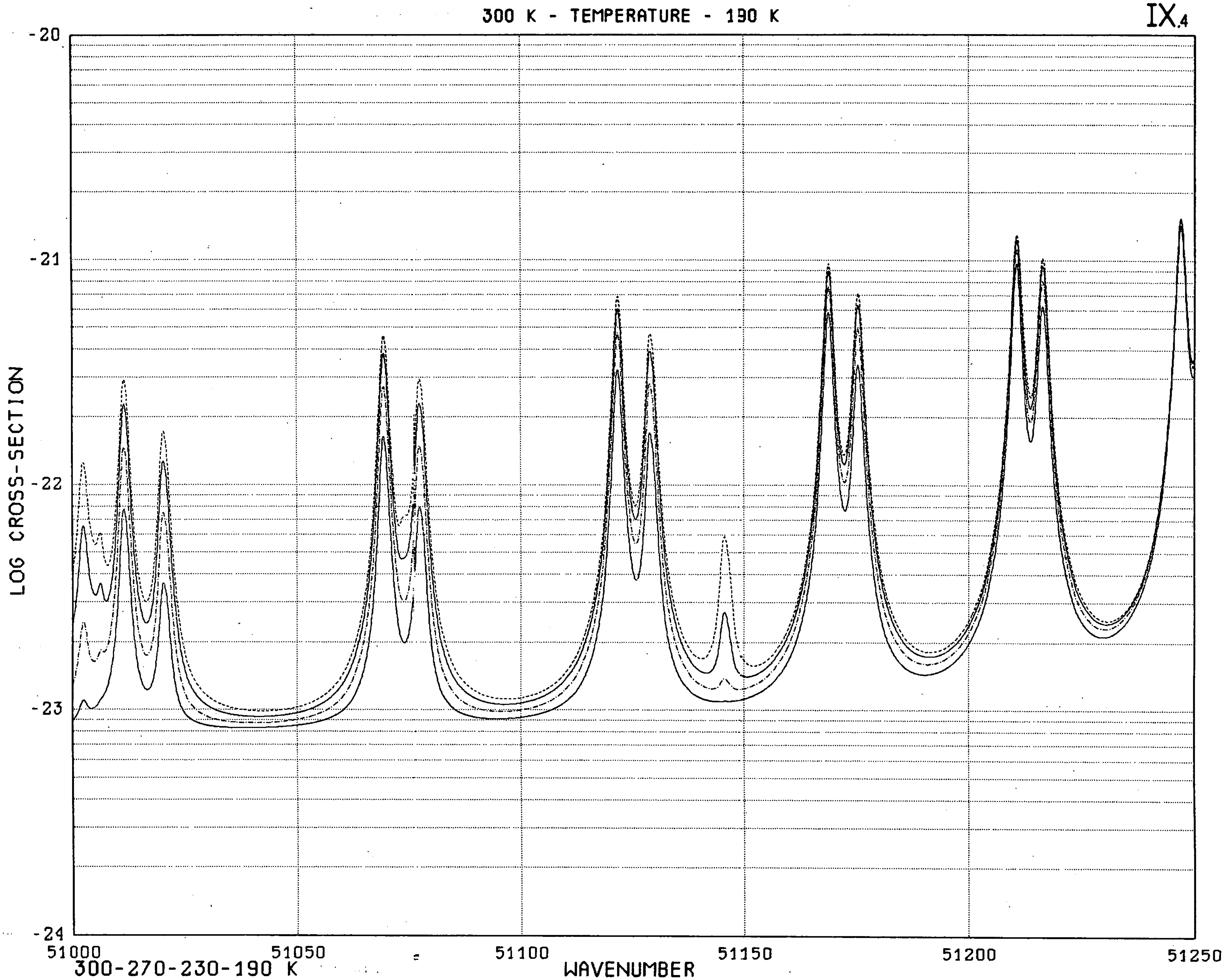
v	λ	band	v	λ	band
51000			51200		
51001.9	1960.71	5-1 P 1	51210.5	1952.72	3-0 P13
51002.4	1960.69	5-1 R 3	51210.6	1952.72	3-0 P13
51002.5	1960.69	5-1 R 3	51211.0	1952.70	3-0 P13
51002.9	1960.67	5-1 R 3	51211.4	1952.69	6-1 P21
51004.7	1960.60	5-1 Q 1	51211.5	1952.69	6-1 P21
51006.3	1960.54	5-1 R 1	51211.9	1952.67	6-1 P21
51006.3	1960.54	5-1 R 1	51212.2	1952.66	6-1 R23
51011.4	1960.35	3-0 P21	51212.4	1952.65	6-1 R23
51011.5	1960.34	3-0 P21	51213.0	1952.63	6-1 R23
51012.1	1960.32	3-0 P21	51216.3	1952.50	3-0 R15
51020.0	1960.01	3-0 R23	51216.4	1952.50	3-0 R15
51020.3	1960.01	3-0 R23	51217.0	1952.48	3-0 R15
51021.0	1959.98	3-0 R23	51246.9	1951.34	3-0 P11
51050			51247.0	1951.33	3-0 P11
51069.2	1958.13	3-0 P19	51247.4	1951.32	3-0 P11
51069.2	1958.13	3-0 P19			
51069.8	1958.10	3-0 P19			
51073.5	1957.96	6-1 P25			
51073.6	1957.96	6-1 P25			
51074.1	1957.94	6-1 P25			
51074.2	1957.93	6-1 R27			
51074.5	1957.92	6-1 R27			
51075.1	1957.90	6-1 R27			
51077.1	1957.82	3-0 R21			
51077.3	1957.82	3-0 R21			
51078.1	1957.79	3-0 R21			
51100					
51121.6	1956.12	3-0 P17			
51121.7	1956.12	3-0 P17			
51122.2	1956.10	3-0 P17			
51128.9	1955.84	3-0 R19			
51129.0	1955.84	3-0 R19			
51129.7	1955.81	3-0 R19			
51145.3	1955.21	6-1 P23			
51145.4	1955.21	6-1 P23			
51145.8	1955.19	6-1 P23			
51146.0	1955.18	6-1 R25			
51146.3	1955.18	6-1 R25			
51146.9	1955.15	6-1 R25			
51150					
51168.8	1954.32	3-0 P15			
51168.8	1954.32	3-0 P15			
51169.3	1954.30	3-0 P15			
51175.3	1954.07	3-0 R17			
51175.4	1954.07	3-0 R17			
51176.0	1954.04	3-0 R17			

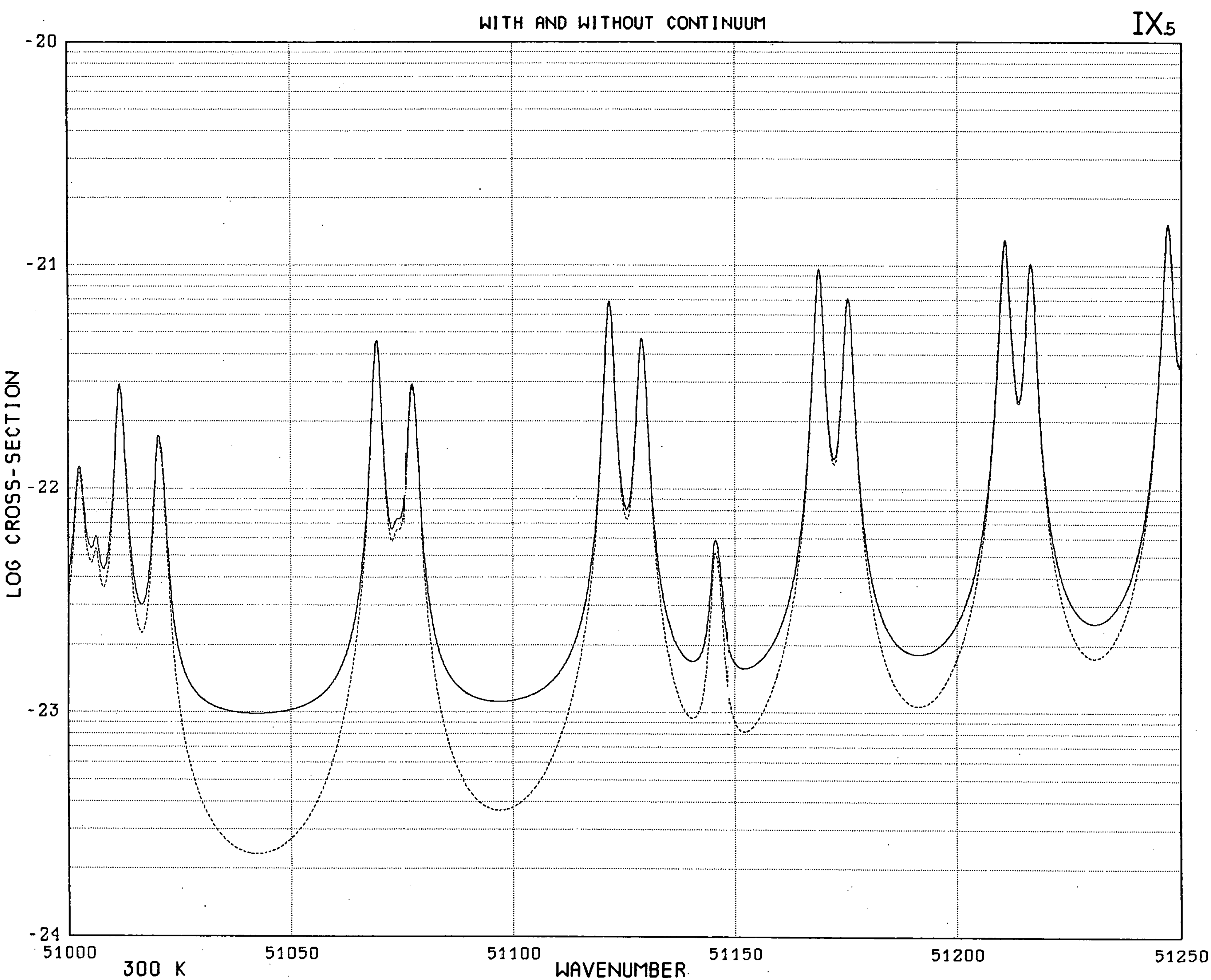

IDENTIFICATION
300K
LABORATORY
CALCULATION
3-0 BAND
P21 R23
P19 R21
P17 R19
P15 R17
P13 R15
P11
5-1 BAND
R3
R1
6-1 BAND
P23
CROSS-SECTION
2
1.10⁻²¹
0
51000
51050
51100
51150
51200
51250
WAVENUMBER


CROSS-SECTION
LABORATORY
CALCULATION
3-0 BAND
P21 R23
P19 R21
P17 R19
P15 R17
P13 R15
P11
5-1
R3
R1
6-1 BAND
P23
R25
3-0 BAND O.S.=8.2x10-8
L.W.=1.8cm-1
CONTINUUM=7.53x10-24cm2
(51000 cm-1)
LOG SIGMA(O2)
-20
-21
-22
-23
-24
51000
51050
51100
51150
51200
51250
300 K
WAVENUMBER

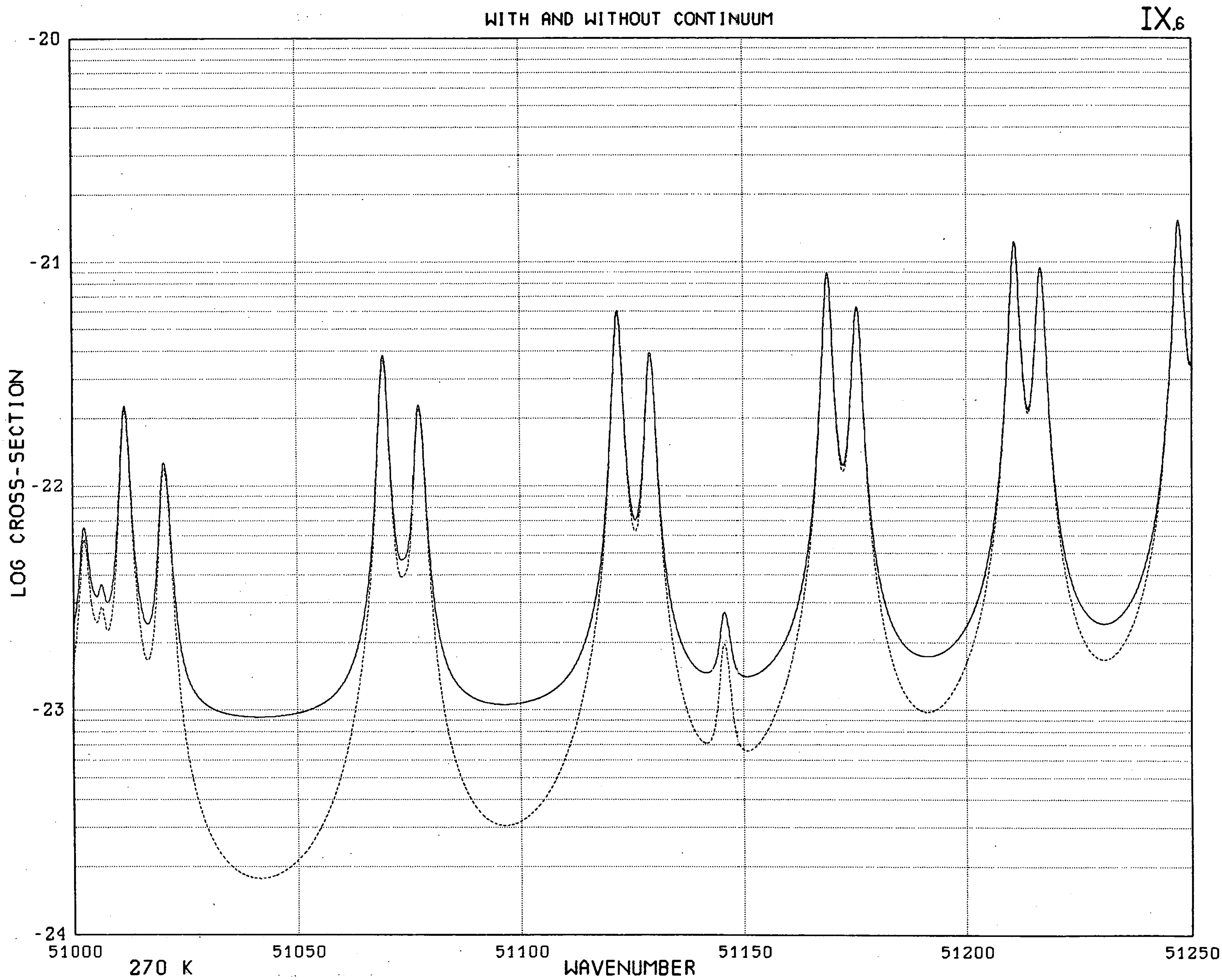


CONTINUUM-VARIATION 10% AND 20%
IX3
LOG CROSS-SECTION
-20
-21
-22
-23
-24
51000
51050
51100
51150
51200
51250
300 K
WAVENUMBER

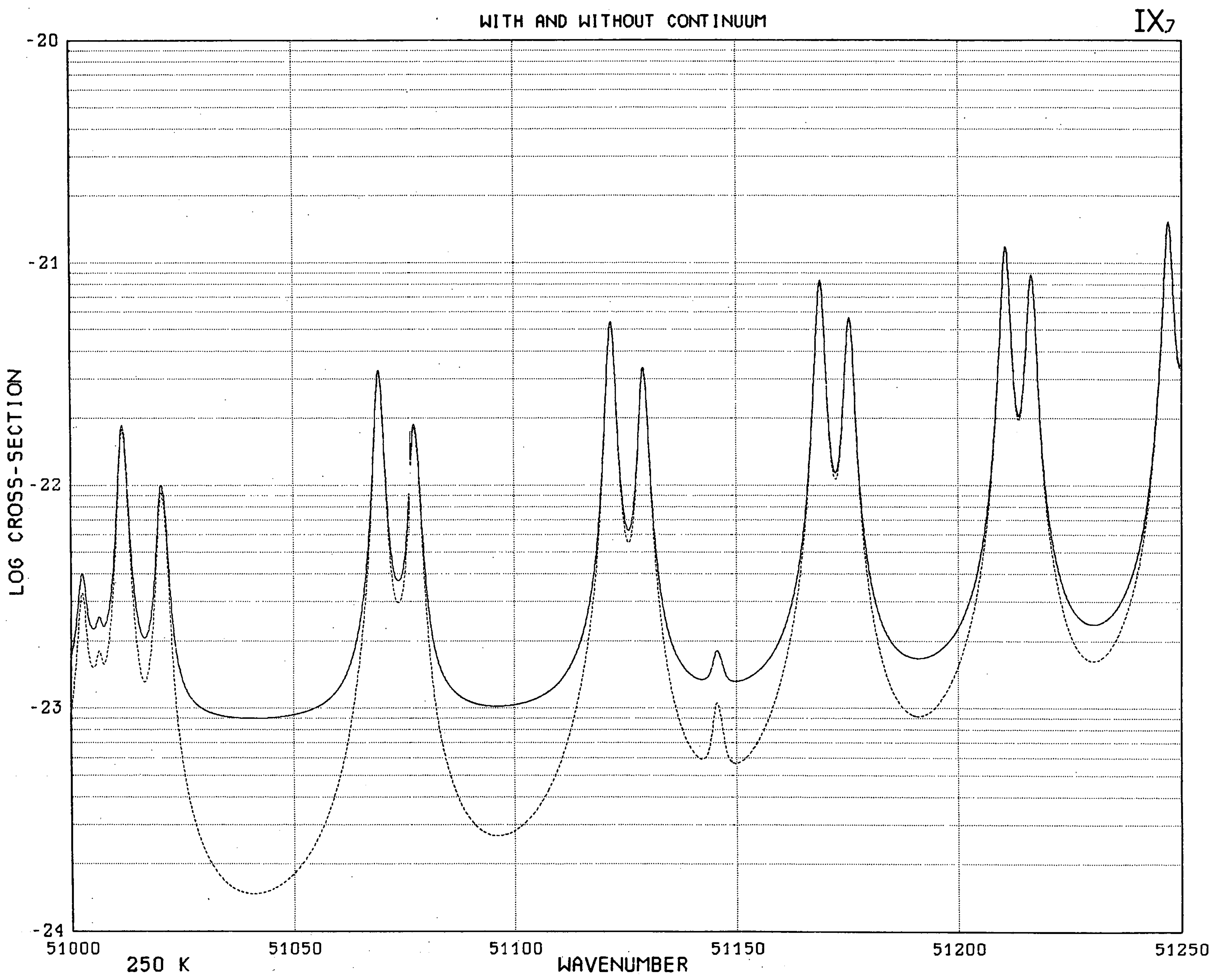

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-20
-21
-22
-23
-24
51000
51050
51100
51150
51200
51250
WAVENUMBER
300-270-230-190 K



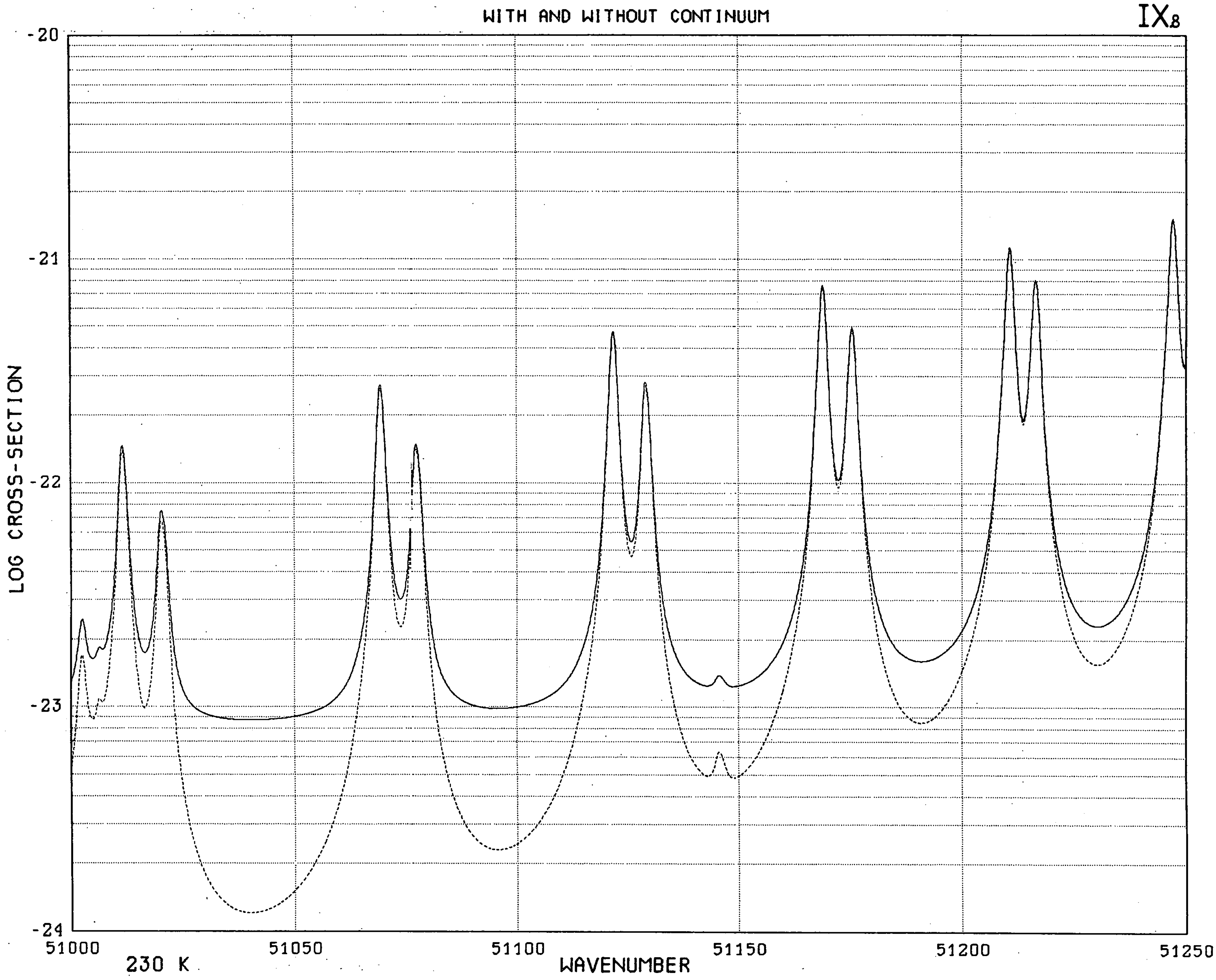
WITH AND WITHOUT CONTINUUM
IX5
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51000
51050
51100
51150
51200
51250
300 K
WAVENUMBER



WITH AND WITHOUT CONTINUUM
IX.6
LOG CROSS-SECTION
-20
-21
-22
-23
-24
51000
51050
51100
51150
51200
51250
270 K
WAVENUMBER



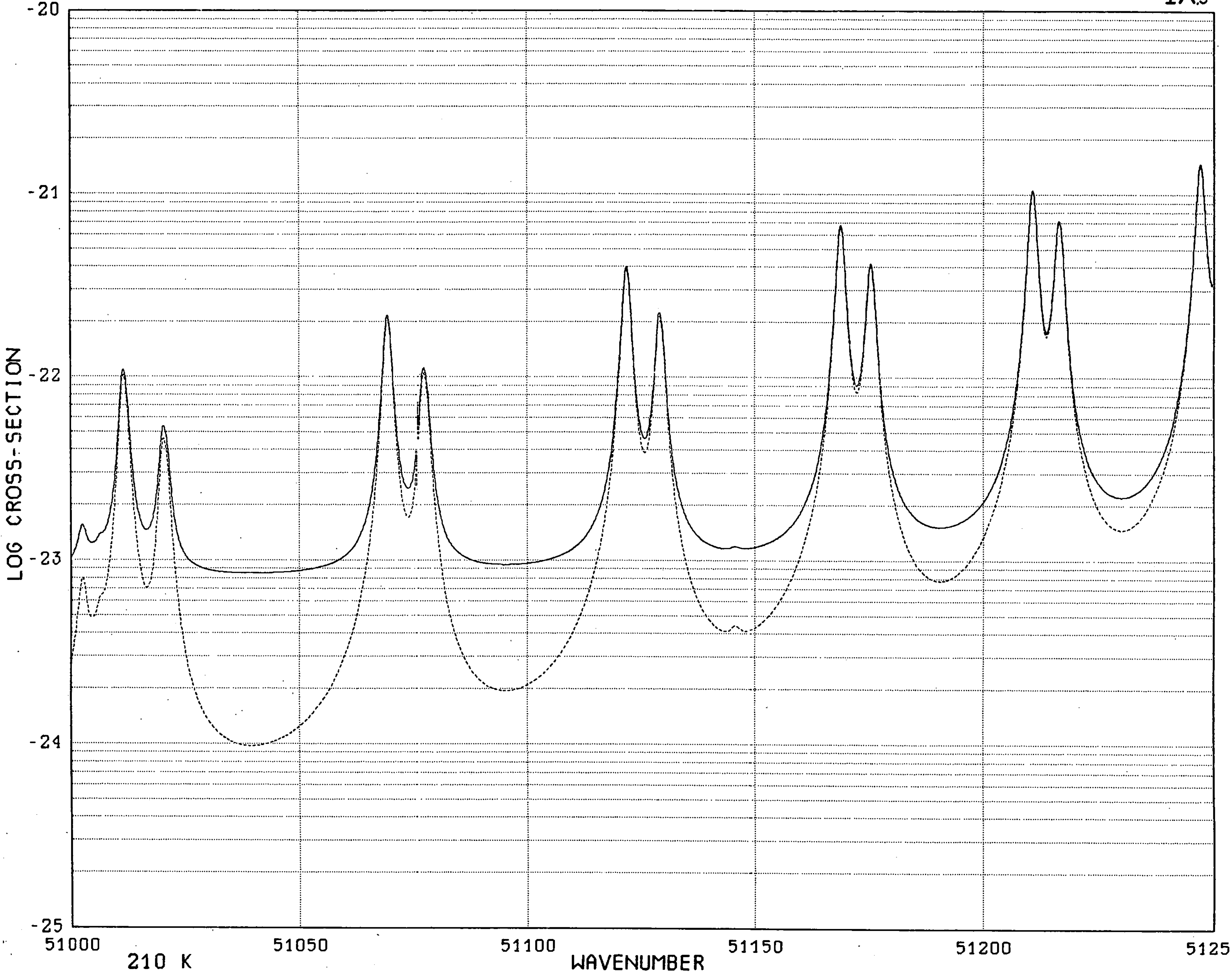
WITH AND WITHOUT CONTINUUM
IX7
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51000
51050
51100
51150
51200
51250
250 K
WAVENUMBER

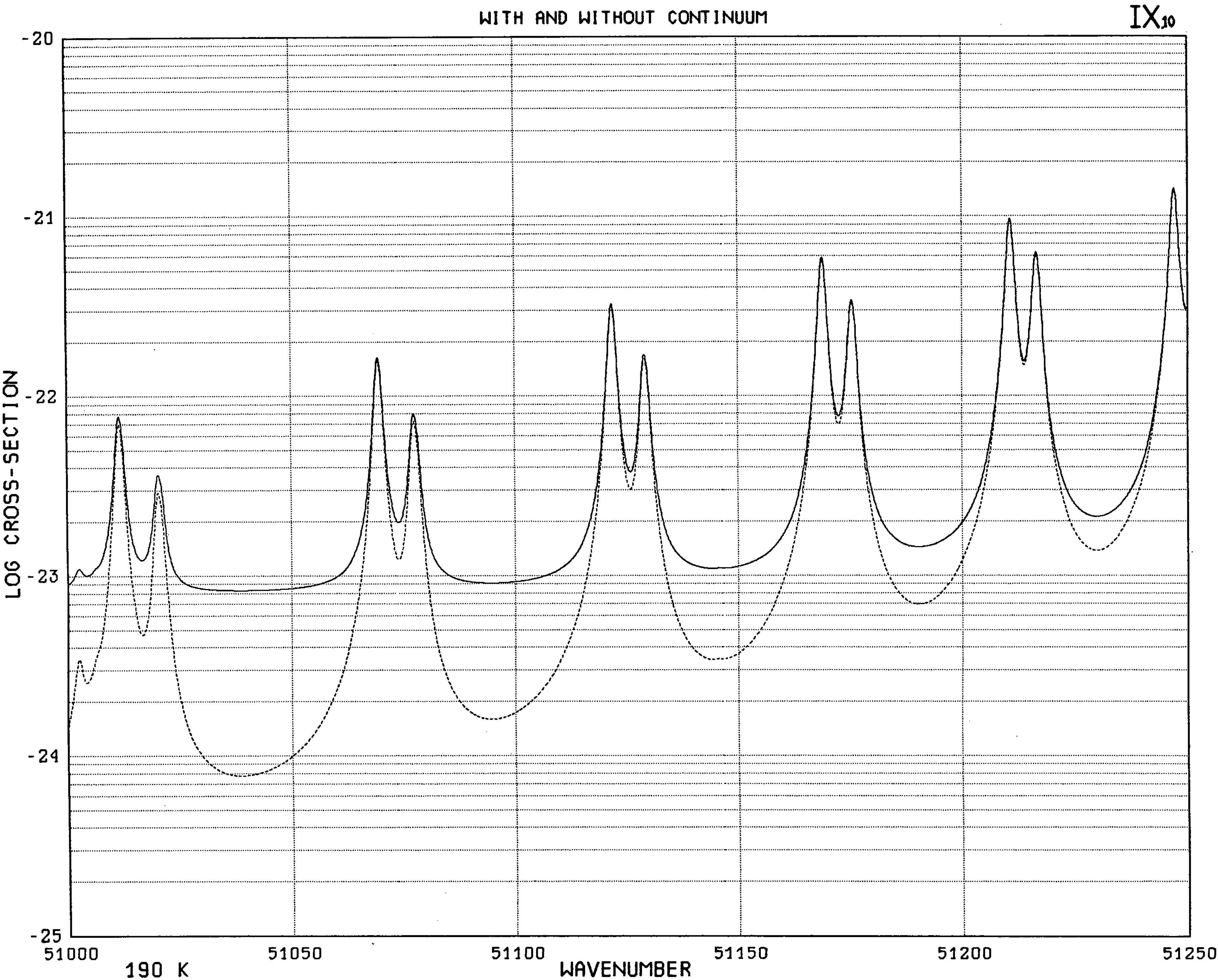


WITH AND WITHOUT CONTINUUM
IX8
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51000
51050
51100
51150
51200
51250
230 K
WAVENUMBER

WITH AND WITHOUT CONTINUUM

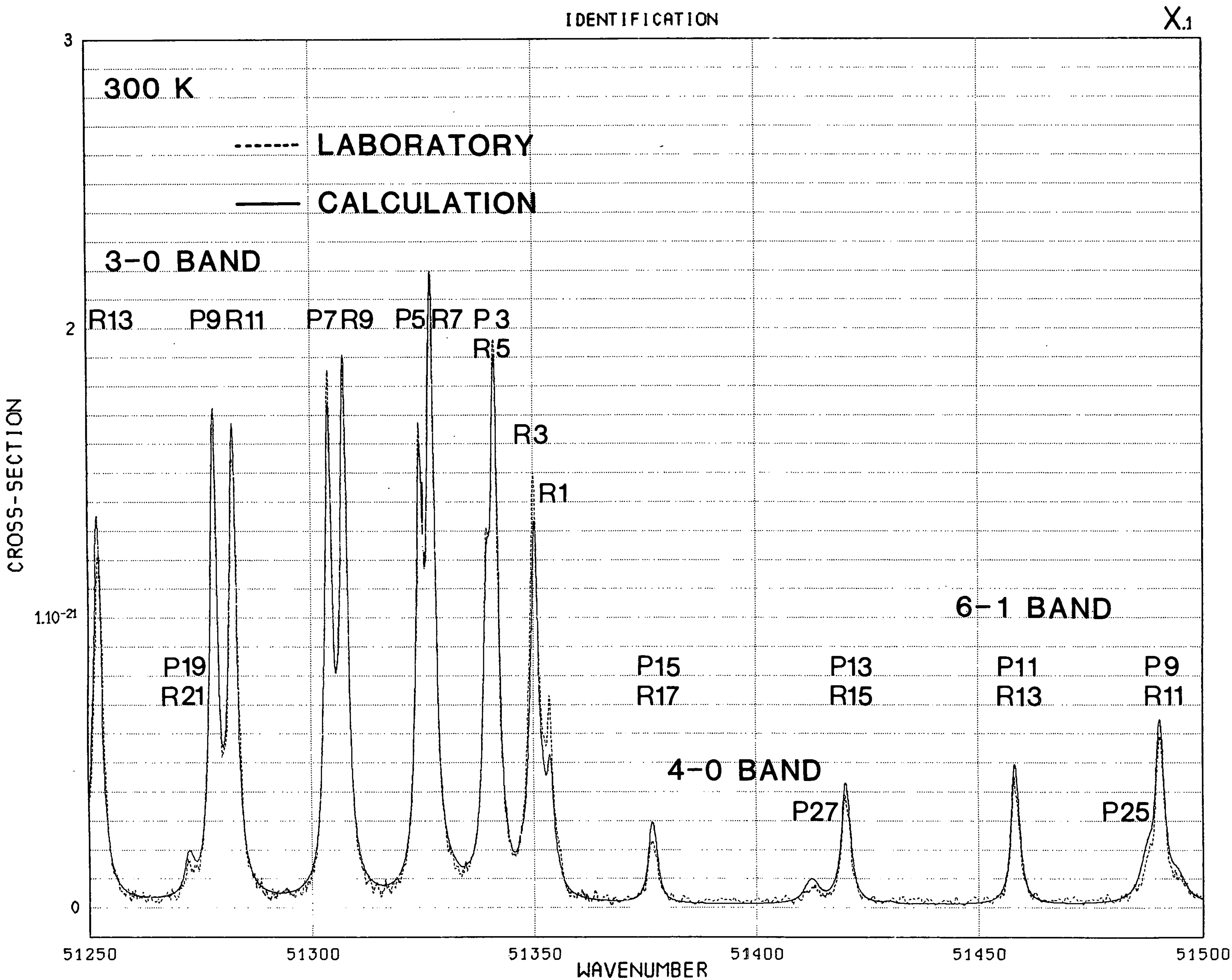
IX.9



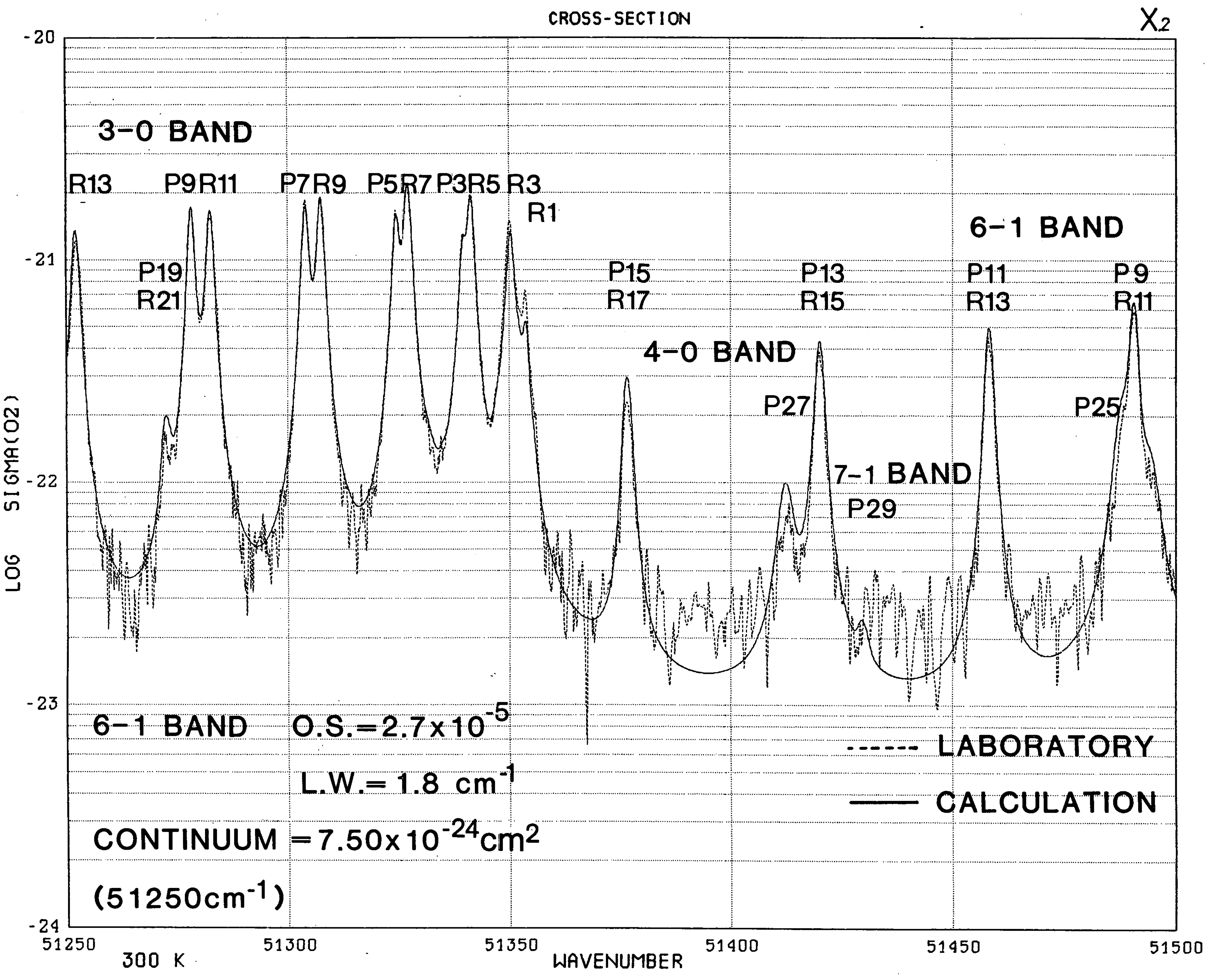

WITH AND WITHOUT CONTINUUM
IX10
LOG CROSS-SECTION
-20
-21
-22
-23
-24
-25
51000
51050
51100
51150
51200
51250
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
51250 - 51500 cm^{-1}

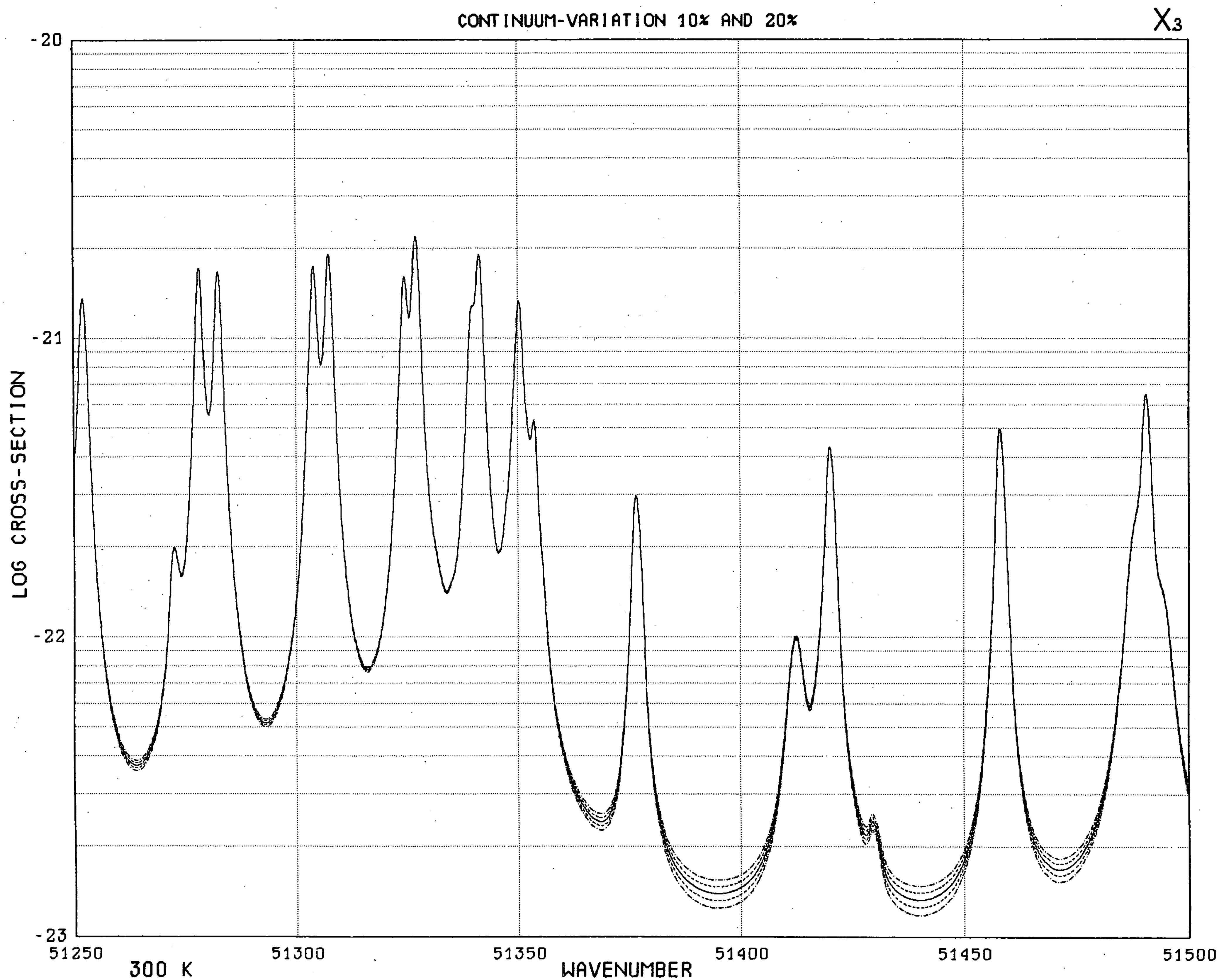
ν	λ	band	ν	λ	band
51250					
51252.0	1951.14	3-0 R13	51350.2	1947.41	3-0 R 3
51252.0	1951.14	3-0 R13	51350.6	1947.40	3-0 R 3
51252.6	1951.12	3-0 R13	51352.1	1947.34	3-0 Q 1
51272.0	1950.38	6-1 P19	51353.7	1947.28	3-0 R 1
51272.0	1950.38	6-1 P19	51353.8	1947.28	3-0 R 1
51272.4	1950.37	6-1 P19	51376.1	1946.43	6-1 P15
51272.8	1950.35	6-1 R21	51376.1	1946.43	6-1 P15
51272.9	1950.35	6-1 R21	51376.5	1946.41	6-1 P15
51273.4	1950.33	6-1 R21	51376.9	1946.40	6-1 R17
51278.0	1950.15	3-0 P 9	51377.0	1946.40	6-1 R17
51278.1	1950.15	3-0 P 9	51377.5	1946.38	6-1 R17
51278.5	1950.13	3-0 P 9	51400		
51282.3	1949.99	3-0 R11	51411.9	1945.07	4-0 P27
51282.3	1949.99	3-0 R11	51412.4	1945.06	4-0 P27
51282.9	1949.97	3-0 R11	51413.1	1945.03	4-0 P27
51300			51418.6	1944.82	4-0 R29
51303.8	1949.17	3-0 P 7	51419.3	1944.80	4-0 R29
51303.9	1949.17	3-0 P 7	51419.8	1944.78	6-1 P13
51304.2	1949.16	3-0 P 7	51419.8	1944.78	6-1 P13
51307.3	1949.04	3-0 R 9	51420.2	1944.76	6-1 P13
51307.3	1949.04	3-0 R 9	51420.3	1944.76	4-0 R29
51307.8	1949.02	3-0 R 9	51420.5	1944.75	6-1 R15
51324.2	1948.40	3-0 P 5	51420.6	1944.75	6-1 R15
51324.4	1948.39	3-0 P 5	51421.0	1944.73	6-1 R15
51324.7	1948.38	3-0 P 5	51429.3	1944.42	7-1 P29
51326.9	1948.30	6-1 P17	51429.9	1944.40	7-1 P29
51326.9	1948.30	6-1 P17	51430.7	1944.37	7-1 P29
51326.9	1948.30	3-0 R 7	51450		
51327.0	1948.29	3-0 R 7	51457.8	1943.34	6-1 P11
51327.3	1948.28	6-1 P17	51457.9	1943.34	6-1 P11
51327.4	1948.28	3-0 R 7	51458.2	1943.33	6-1 P11
51327.6	1948.27	6-1 R19	51458.5	1943.32	6-1 R13
51327.8	1948.26	6-1 R19	51458.5	1943.31	6-1 R13
51328.3	1948.24	6-1 R19	51458.9	1943.30	6-1 R13
51330.9	1948.14	4-0 P29	51487.4	1942.22	4-0 P25
51331.4	1948.13	4-0 P29	51487.8	1942.21	4-0 P25
51332.3	1948.09	4-0 P29	51488.5	1942.18	4-0 P25
51339.3	1947.82	3-0 P 3	51490.2	1942.12	6-1 P 9
51339.5	1947.82	3-0 P 3	51490.3	1942.12	6-1 P 9
51339.8	1947.81	3-0 P 3	51490.6	1942.10	6-1 P 9
51341.2	1947.76	3-0 R 5	51490.8	1942.10	6-1 R11
51341.3	1947.75	3-0 R 5	51490.8	1942.09	6-1 R11
51341.6	1947.74	3-0 R 5	51491.2	1942.08	6-1 R11
51349.2	1947.45	3-0 P 1	51493.8	1941.98	4-0 R27
51350			51494.4	1941.96	4-0 R27
51350.1	1947.42	3-0 R 3	51495.4	1941.92	4-0 R27



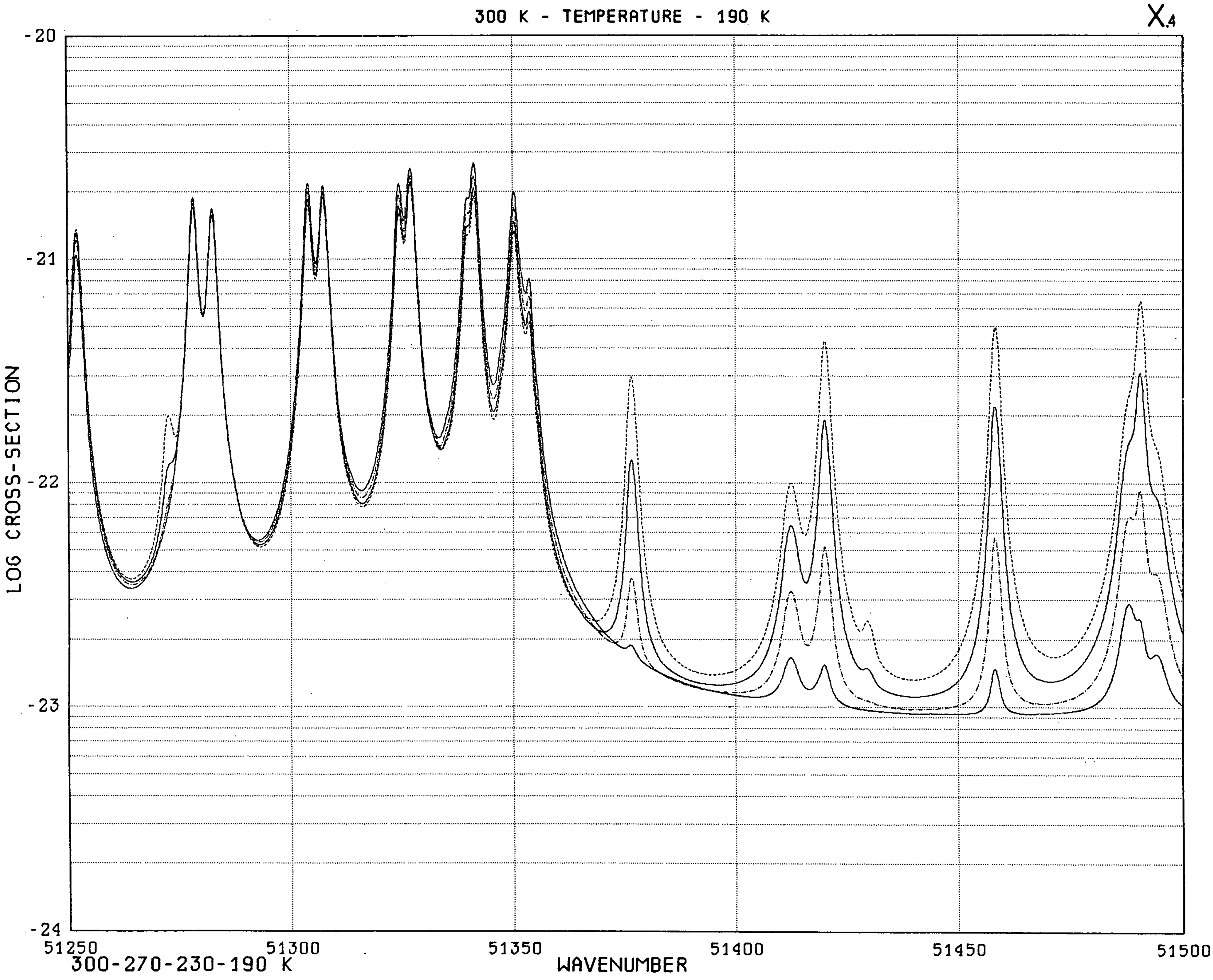
IDENTIFICATION
X.1
300 K
LABORATORY
CALCULATION
3-0 BAND
R13
P9 R11
P7 R9
P5 R7 P 3
R 5
R3
R1
P19
R21
P15
R17
P13
R15
P11
R13
P9
R11
6-1 BAND
4-0 BAND
P27
P25
CROSS-SECTION
3
2
1.10^{-21}
0
51250
51300
51350
51400
51450
51500
WAVENUMBER

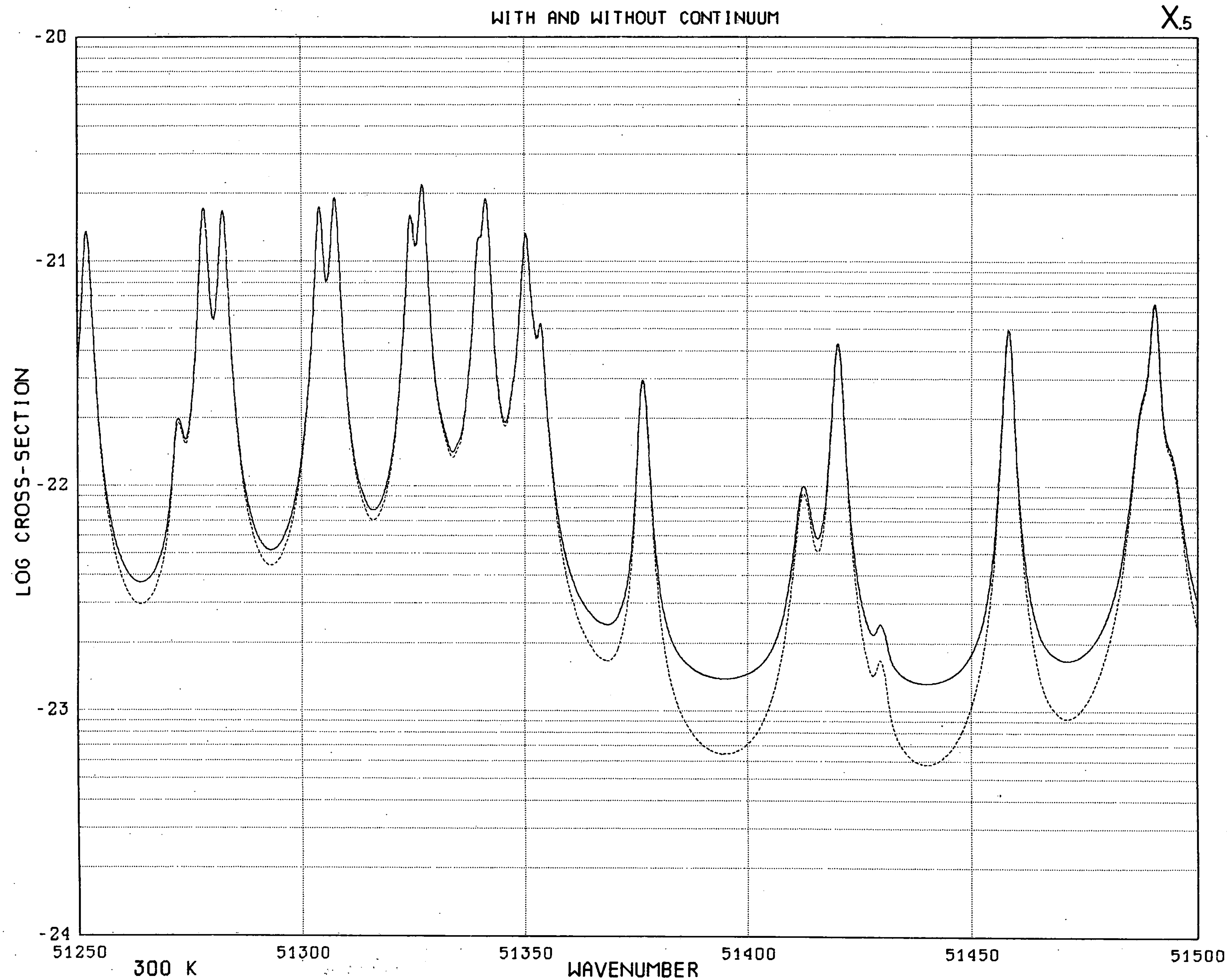


CROSS-SECTION
X2
3-0 BAND
R13
P9R11
P7R9
P5R7
P3R5
R3
R1
P19
R21
P15
R17
P13
R15
P11
R13
P9
R11
6-1 BAND
4-0 BAND
P27
P25
7-1 BAND
P29
6-1 BAND
O.S.=2.7x10-5
L.W.= 1.8 cm-1
CONTINUUM =7.50x10-24cm2
(51250cm-1)
LABORATORY
CALCULATION
LOG SIGMA(O2)
-20
-21
-22
-23
-24
51250
51300
51350
51400
51450
51500
300 K
WAVENUMBER

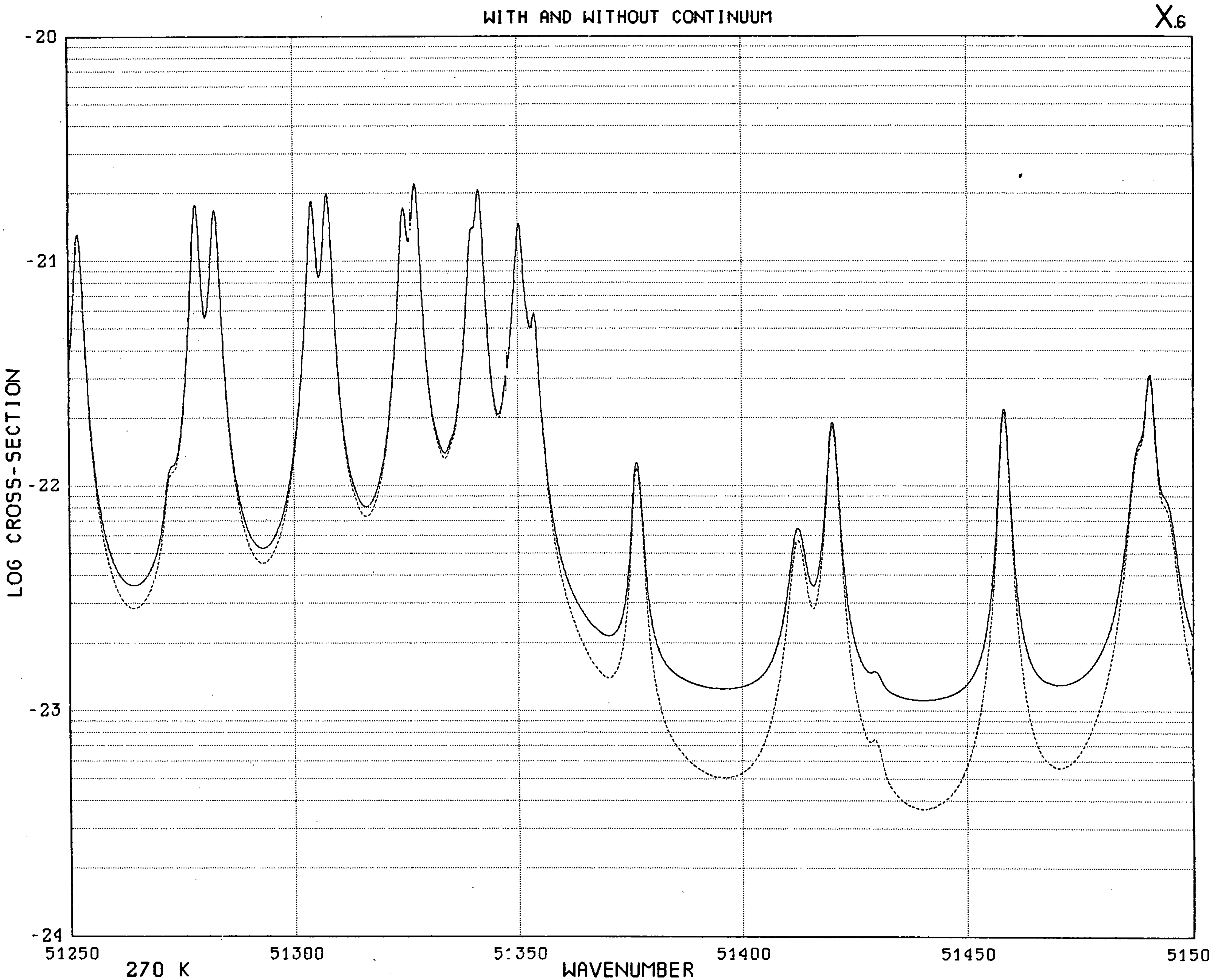


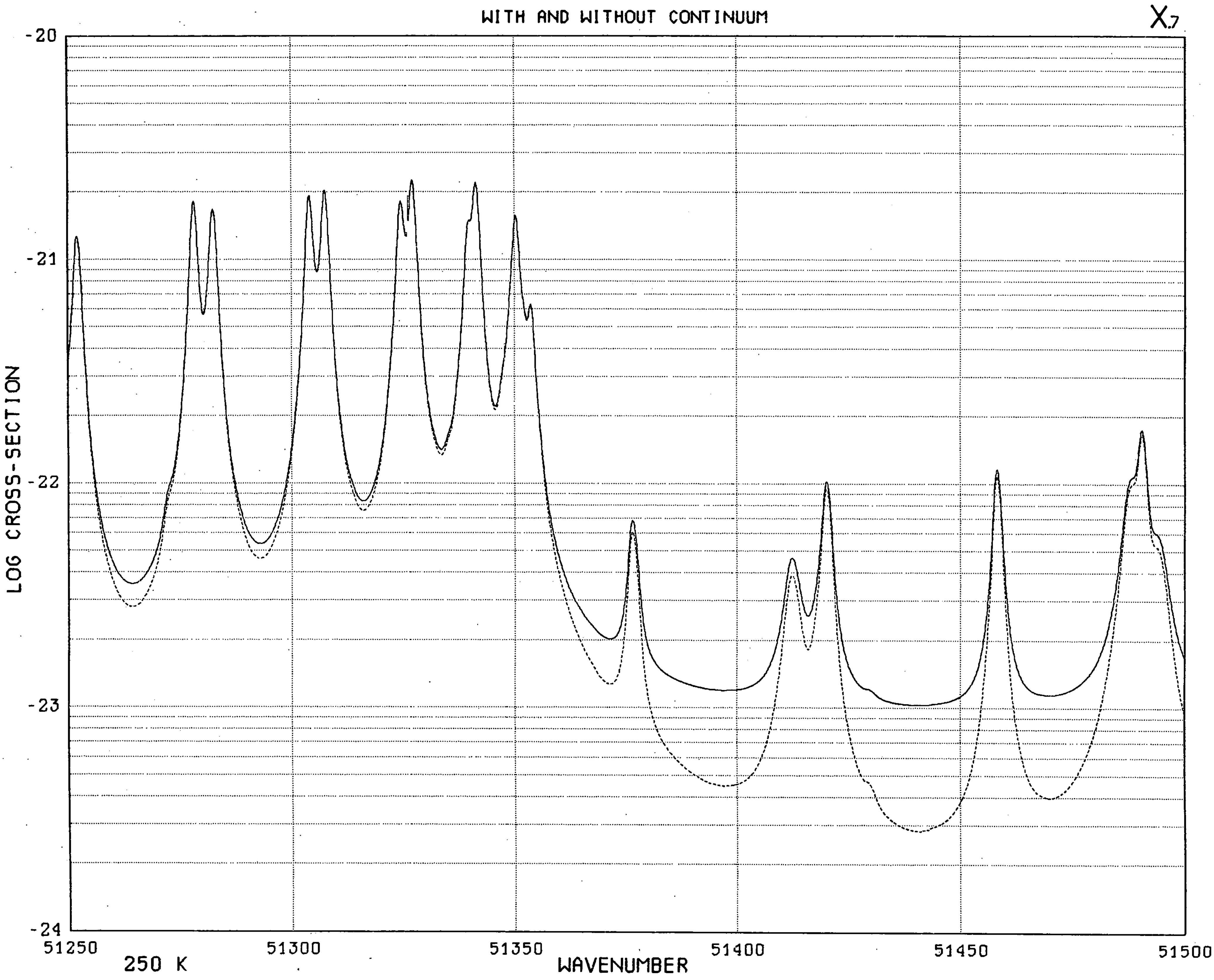
CONTINUUM-VARIATION 10% AND 20%
X3
LOG CROSS-SECTION
-20
-21
-22
-23
51250
51300
51350
51400
51450
51500
300 K
WAVENUMBER

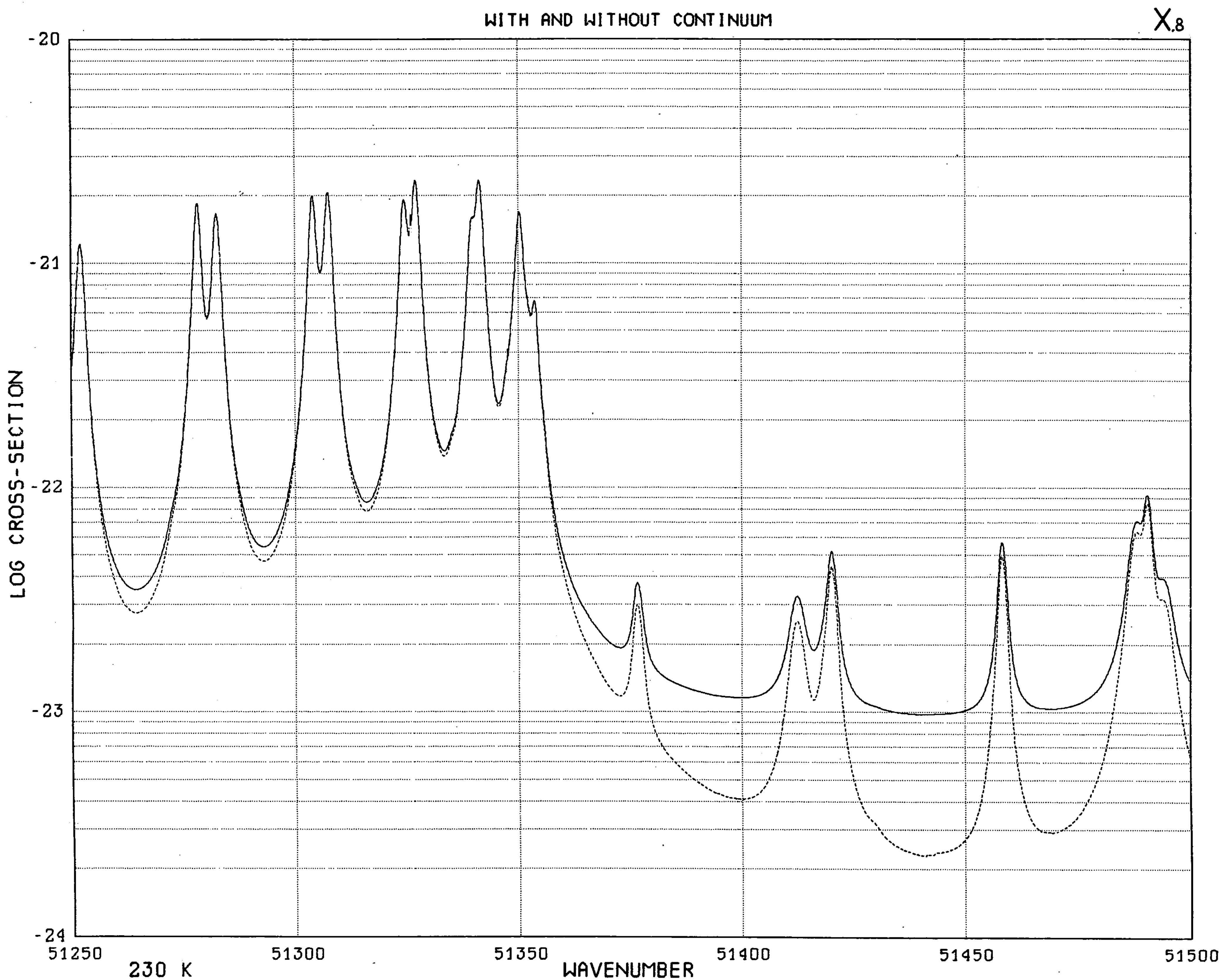

300 K - TEMPERATURE - 190 K
X.4
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51250
51300
51350
51400
51450
51500
300-270-230-190 K
WAVENUMBER

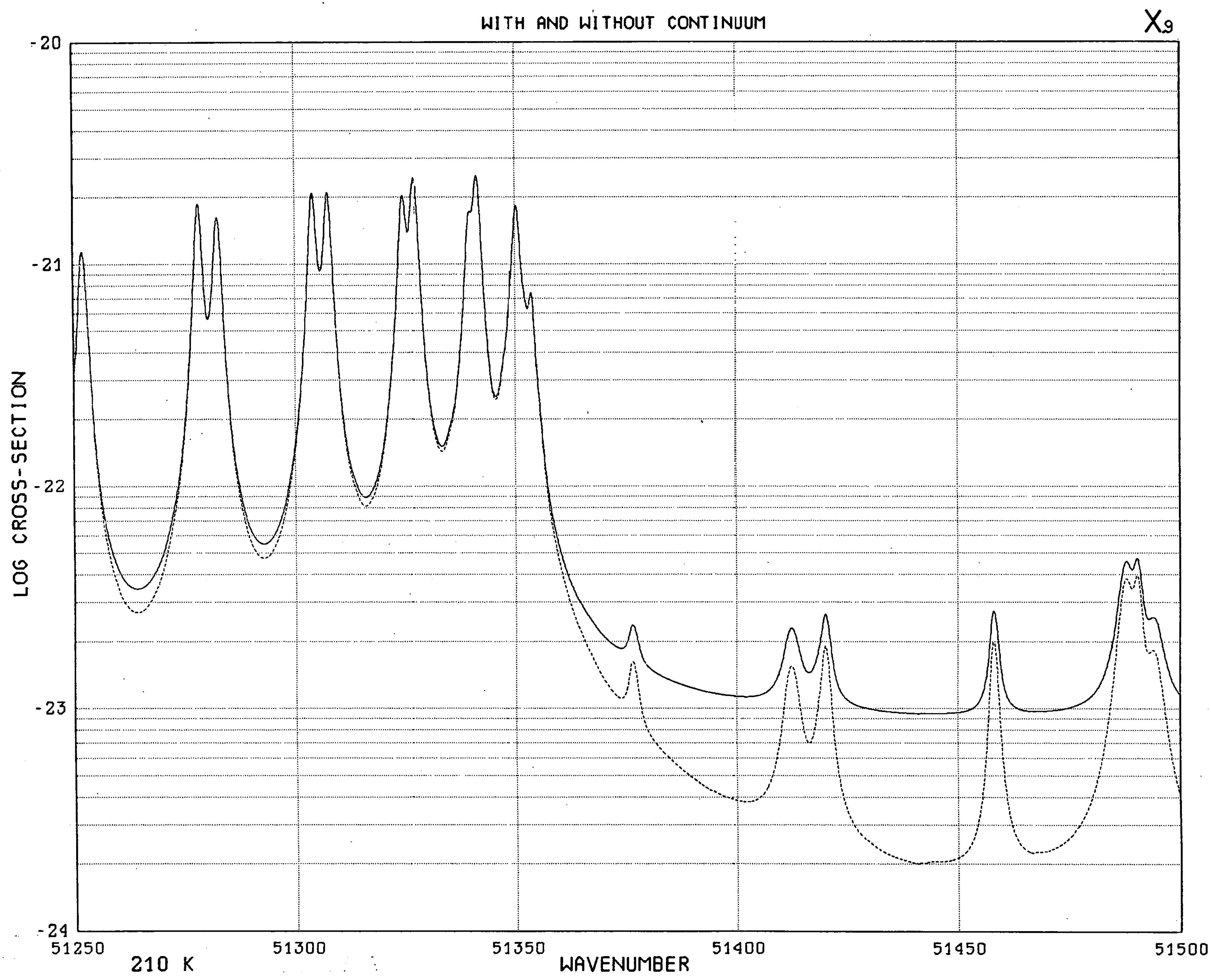


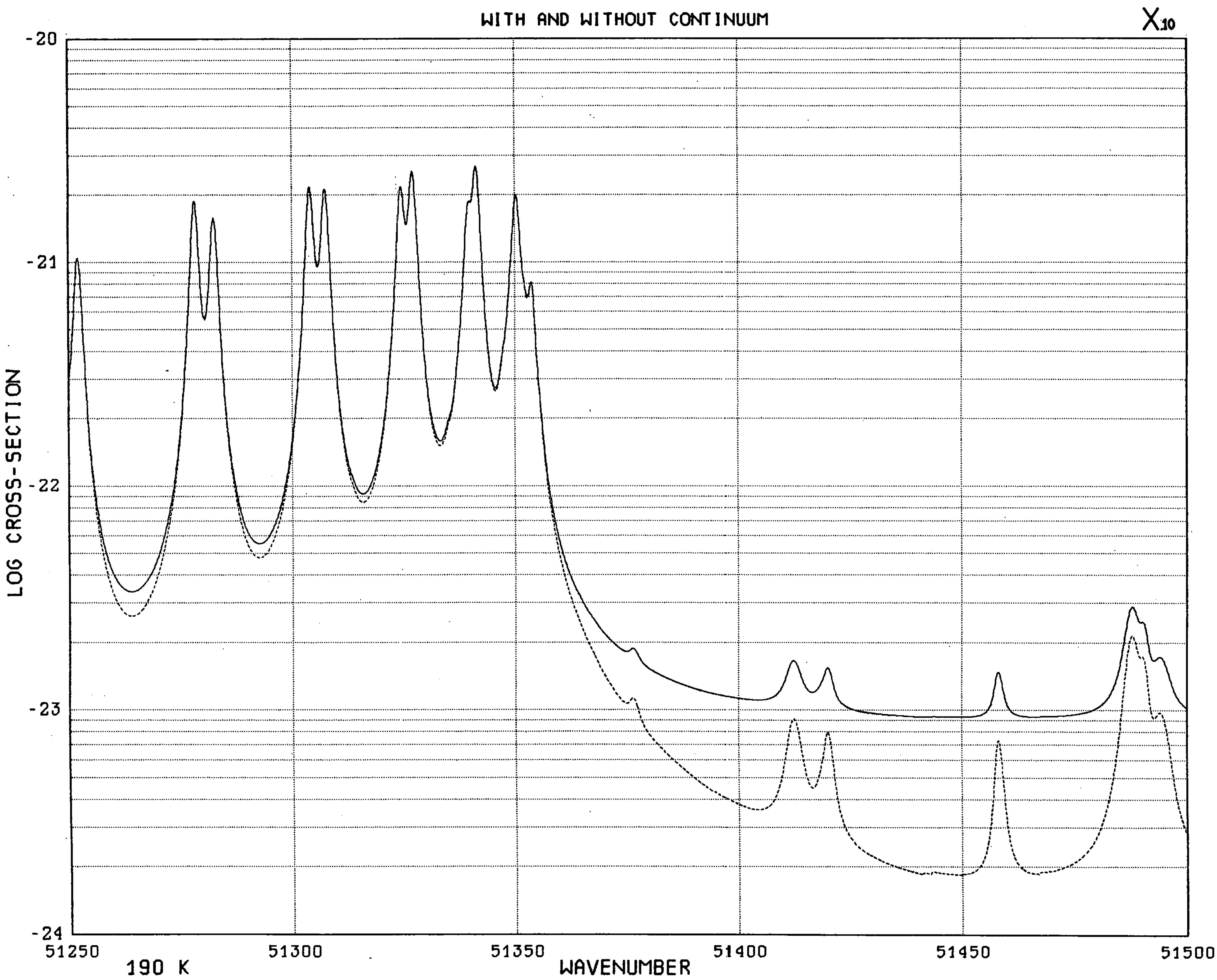
WITH AND WITHOUT CONTINUUM
X.5
LOG CROSS-SECTION
-20
-21
-22
-23
-24
51250
51300
51350
51400
51450
51500
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
X.6
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51250
51300
51350
51400
51450
51500
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
X.7
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51250
51300
51350
51400
51450
51500
250 K
WAVENUMBER

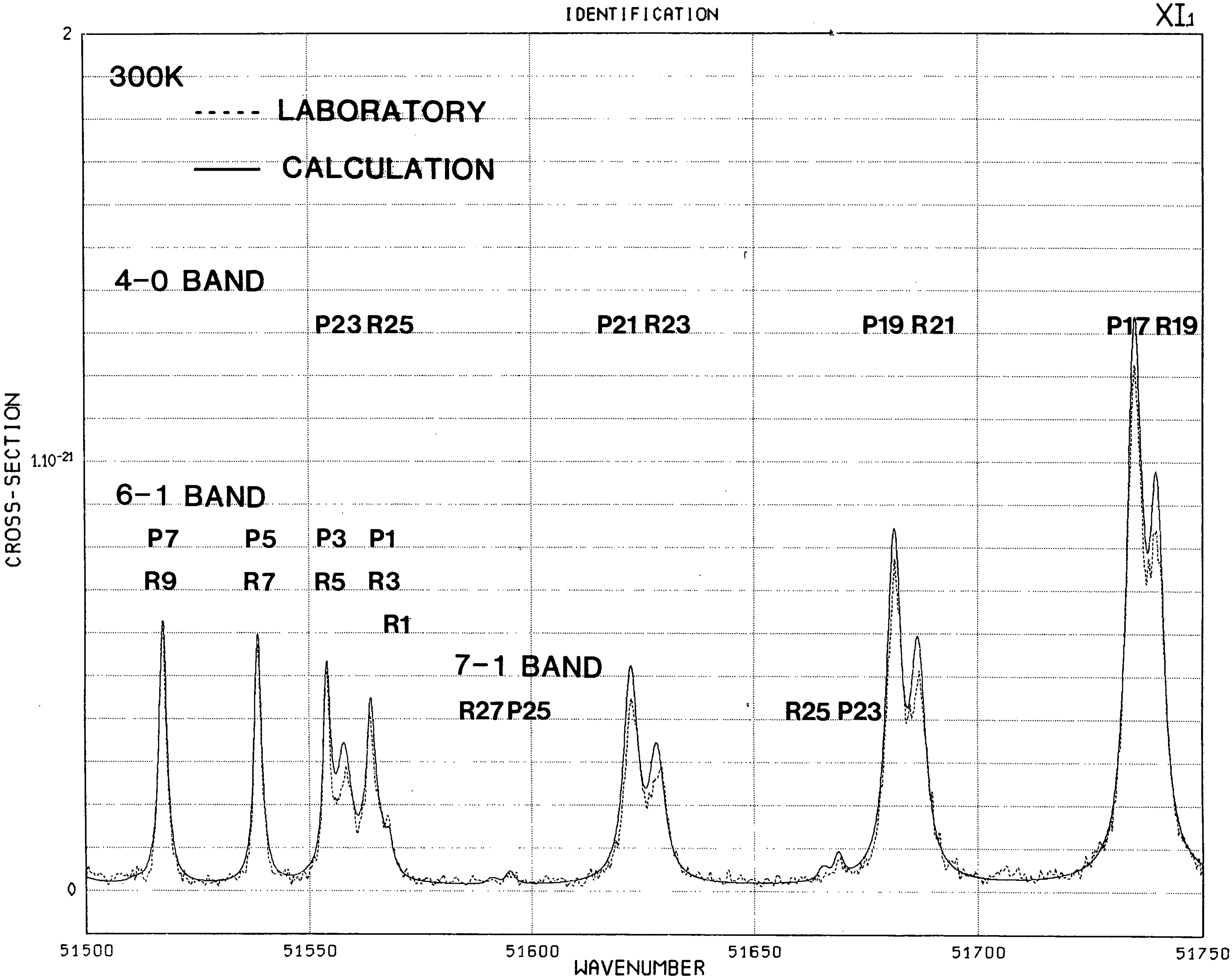

WITH AND WITHOUT CONTINUUM
X.8
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51250
51300
51350
51400
51450
51500
230 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
X9
LOG CROSS-SECTION
-20
-21
-22
-23
-24
51250
51300
51350
51400
51450
51500
210 K
WAVENUMBER

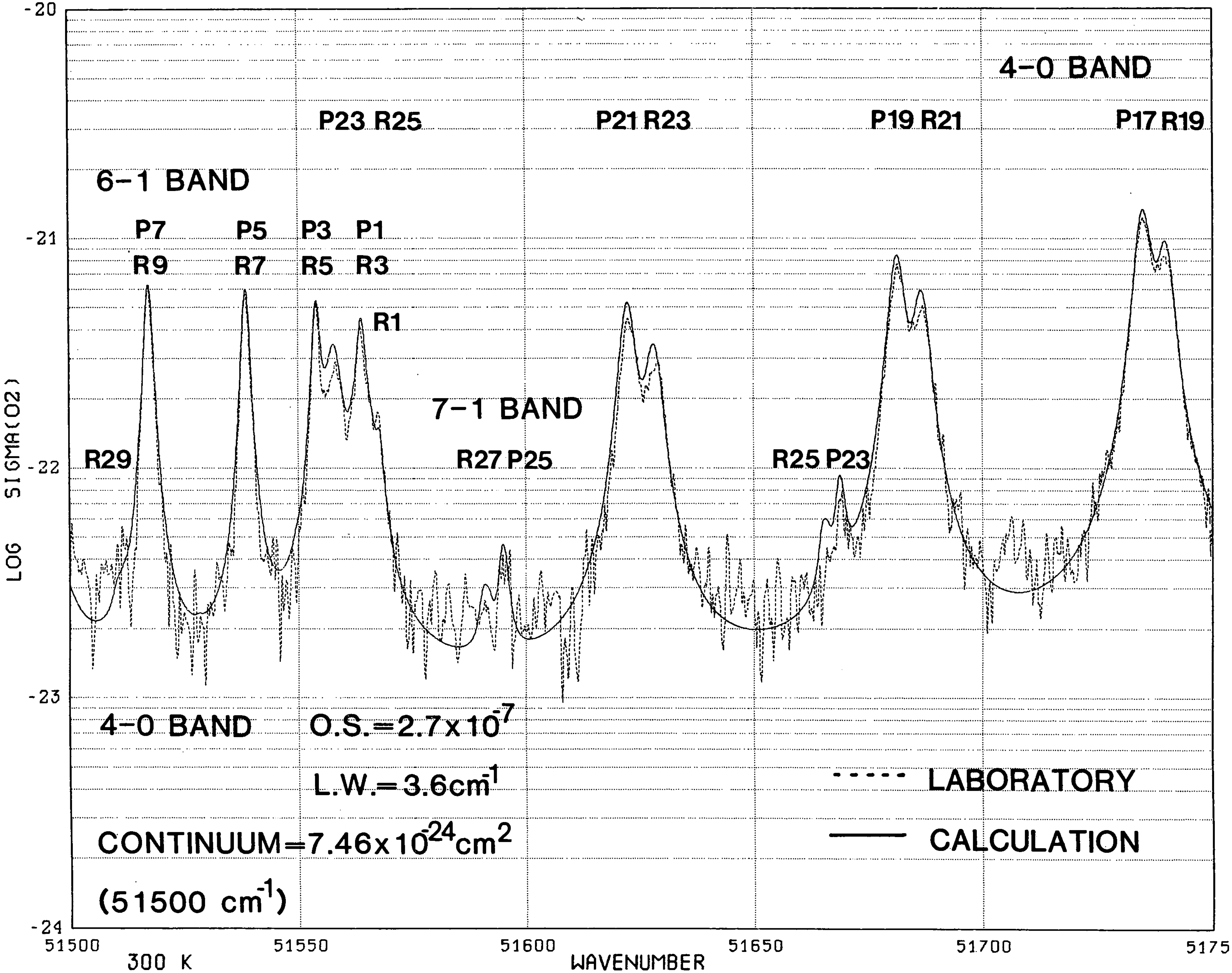

WITH AND WITHOUT CONTINUUM
X.10
LOG CROSS-SECTION
-20
-21
-22
-23
-24
51250
51300
51350
51400
51450
51500
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
51500 - 51750 cm^{-1}

v	λ	band
51500		
51510.0	1941.37	7-1 R29
51510.8	1941.34	7-1 R29
51511.8	1941.30	7-1 R29
51514.9	1941.18	7-1 P27
51515.4	1941.17	7-1 P27
51516.1	1941.14	7-1 P27
51517.0	1941.11	6-1 P 7
51517.1	1941.10	6-1 P 7
51517.3	1941.09	6-1 P 7
51517.5	1941.09	6-1 R 9
51517.5	1941.09	6-1 R 9
51517.9	1941.07	6-1 R 9
51538.2	1940.31	6-1 P 5
51538.2	1940.31	6-1 P 5
51538.5	1940.30	6-1 P 5
51538.5	1940.29	6-1 R 7
51538.6	1940.29	6-1 R 7
51538.9	1940.28	6-1 R 7
51550		
51553.7	1939.73	6-1 P 3
51553.7	1939.72	6-1 P 3
51554.0	1939.71	6-1 R 5
51554.0	1939.71	6-1 R 5
51554.1	1939.71	6-1 P 3
51554.4	1939.70	6-1 R 5
51557.4	1939.59	4-0 P23
51557.8	1939.57	4-0 P23
51558.4	1939.55	4-0 P23
51563.5	1939.36	4-0 R25
51563.5	1939.35	6-1 P 1
51563.8	1939.35	6-1 R 3
51563.8	1939.35	6-1 R 3
51564.0	1939.34	4-0 R25
51564.2	1939.33	6-1 R 3
51566.3	1939.25	6-1 Q 1
51567.9	1939.19	6-1 R 1
51567.9	1939.19	6-1 R 1
51590.4	1938.35	7-1 R27
51591.0	1938.32	7-1 R27
51592.0	1938.29	7-1 R27
51594.7	1938.18	7-1 P25
51595.0	1938.17	7-1 P25
51595.7	1938.15	7-1 P25
51600		
51622.0	1937.16	4-0 P21
51622.3	1937.15	4-0 P21
51622.9	1937.13	4-0 P21
51627.6	1936.95	4-0 R23
51628.1	1936.93	4-0 R23
51628.9	1936.90	4-0 R23
51650		
51664.8	1935.55	7-1 R25
51665.4	1935.53	7-1 R25
51666.2	1935.50	7-1 R25
51668.5	1935.41	7-1 P23
51668.8	1935.40	7-1 P23
51669.4	1935.38	7-1 P23
51681.0	1934.95	4-0 P19
51681.3	1934.94	4-0 P19
51681.9	1934.91	4-0 P19
51686.3	1934.75	4-0 R21
51686.7	1934.73	4-0 R21
51687.5	1934.71	4-0 R21
51700		
51733.4	1932.99	7-1 R23
51733.8	1932.97	7-1 R23
51734.5	1932.95	7-1 R23
51734.6	1932.94	4-0 P17
51734.8	1932.93	4-0 P17
51735.4	1932.91	4-0 P17
51736.5	1932.87	7-1 P21
51736.7	1932.86	7-1 P21
51737.3	1932.84	7-1 P21
51739.4	1932.76	4-0 R19
51739.8	1932.75	4-0 R19
51740.5	1932.72	4-0 R19


IDENTIFICATION
XI1
300K
LABORATORY
CALCULATION
4-0 BAND
P23 R25
P21 R23
P19 R21
P17 R19
6-1 BAND
P7
R9
P5
R7
P3
R5
P1
R3
R1
7-1 BAND
R27 P25
R25 P23
CROSS-SECTION
2
1.10-21
0
51500
51550
51600
51650
51700
51750
WAVENUMBER

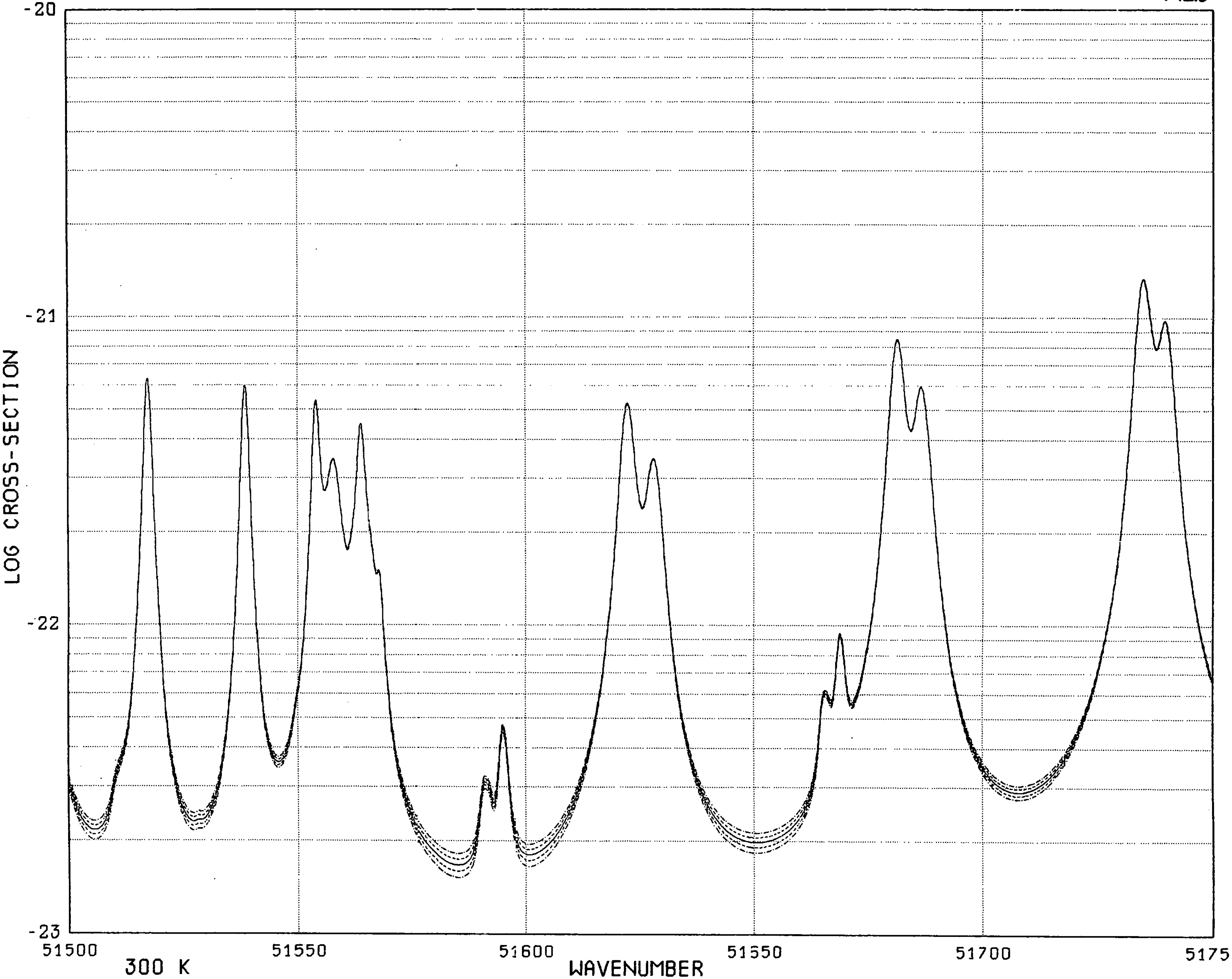
XI₂

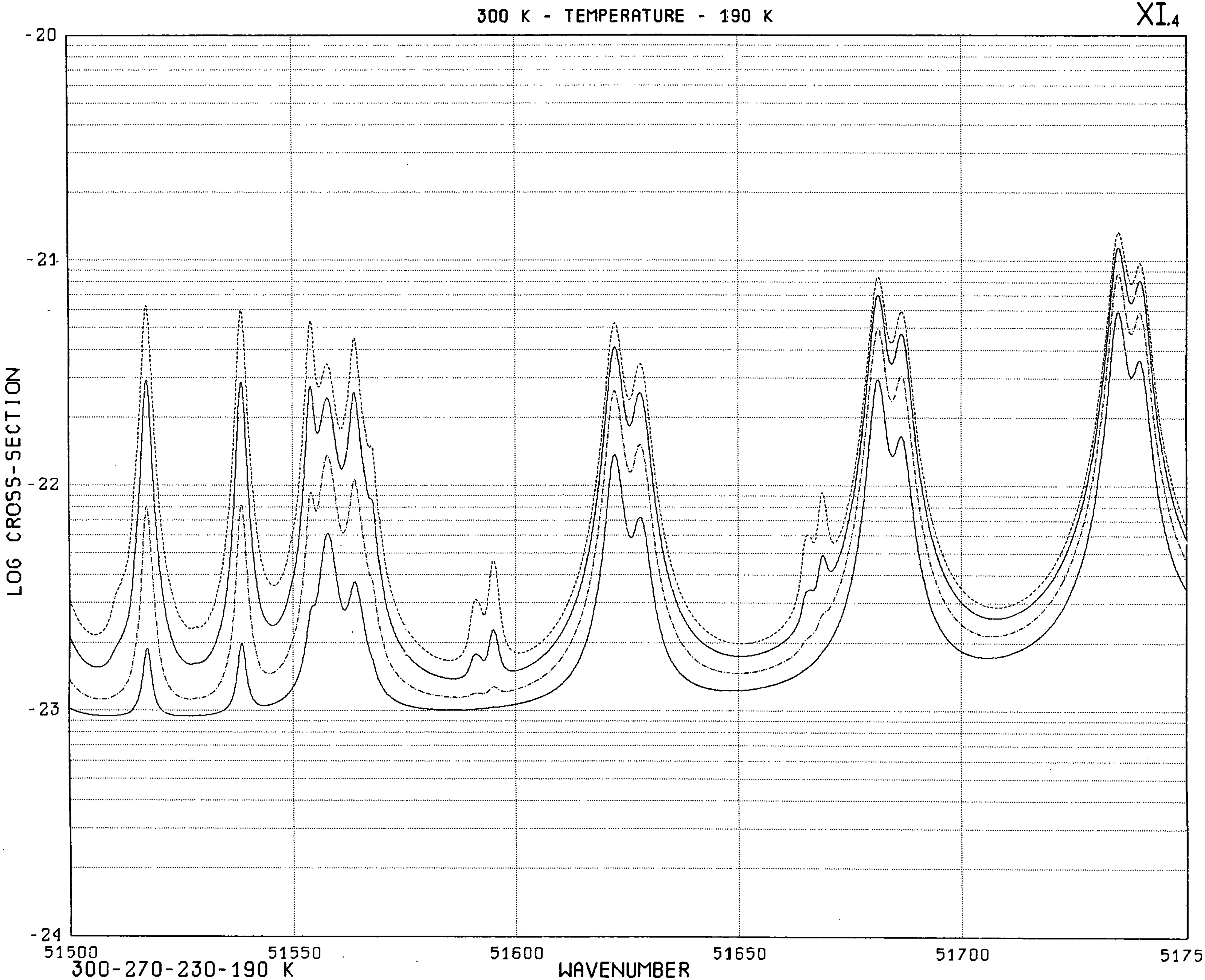


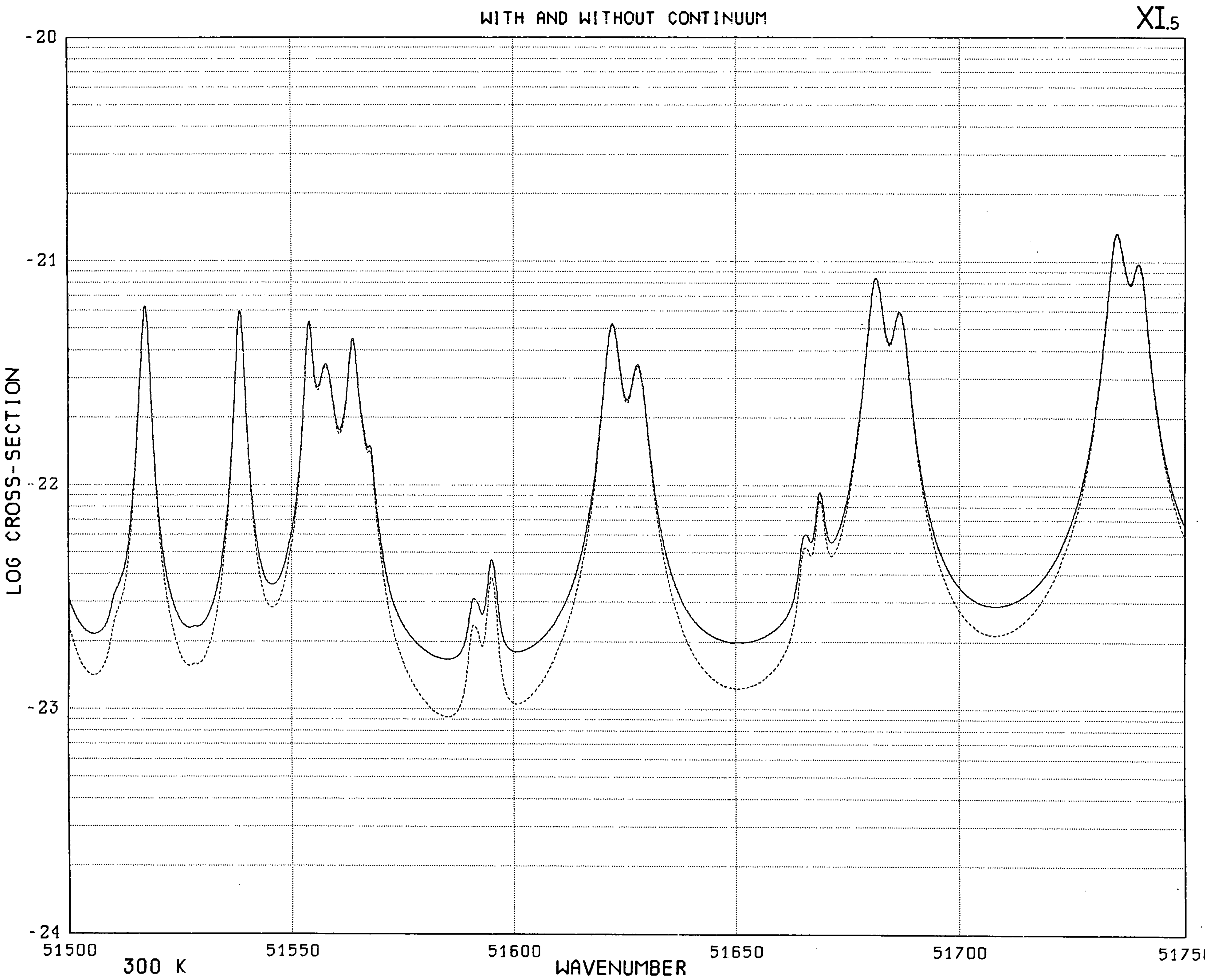
CROSS-SECTION
4-0 BAND
P23 R25
P21 R23
P19 R21
P17 R19
6-1 BAND
P7
R9
P5
R7
P3
R5
P1
R3
R1
7-1 BAND
R29
R27 P25
R25 P23
4-0 BAND
O.S.=2.7x10^{-7}
L.W.=3.6cm^{-1}
CONTINUUM=7.46x10^{-24}cm^2
(51500 cm^{-1})
LABORATORY
CALCULATION
LOG SIGMA(O2)
-20
-21
-22
-23
-24
51500
51550
51600
51650
51700
51750
300 K
WAVENUMBER

CONTINUUM-VARIATION 10% AND 20%

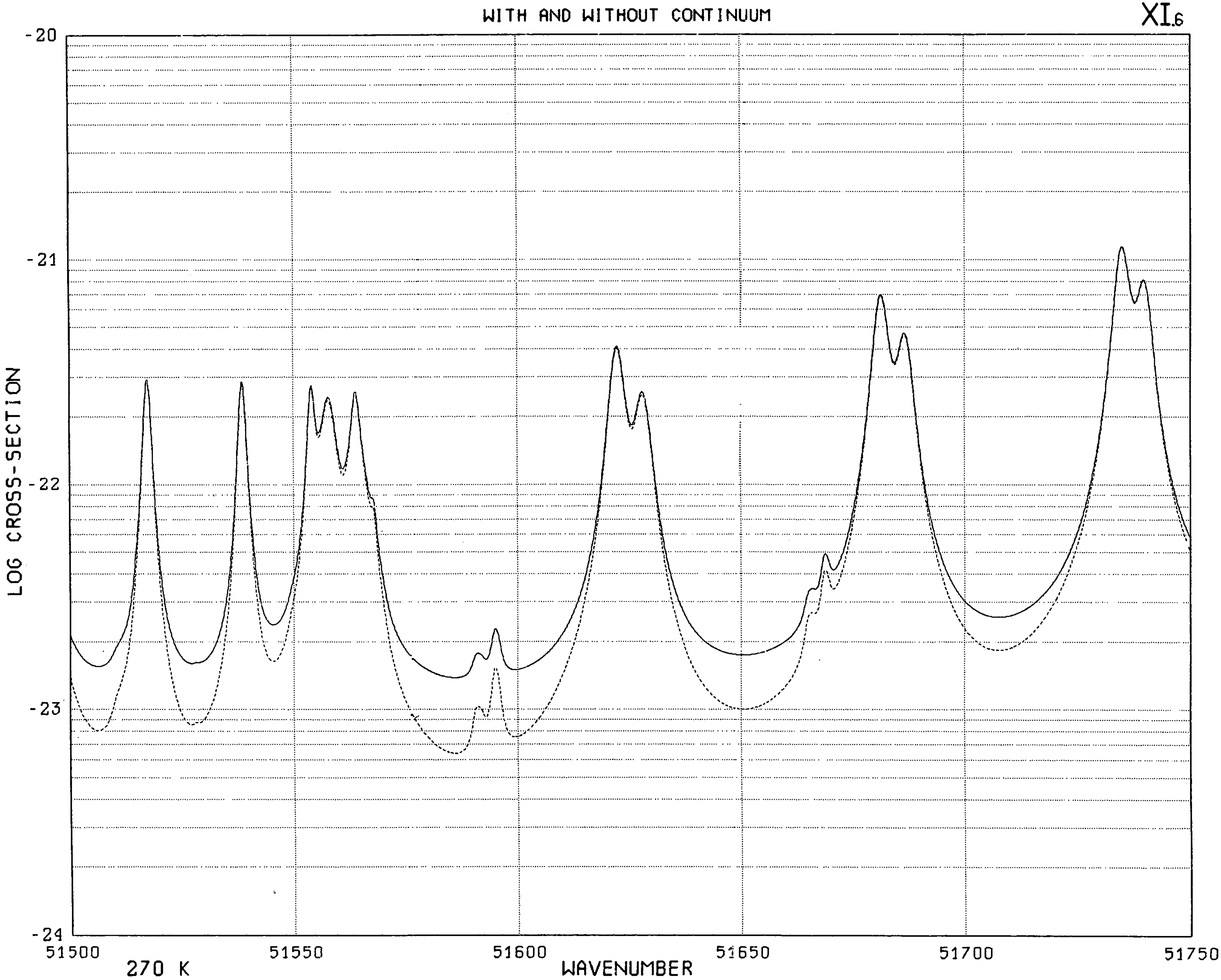
XI.3

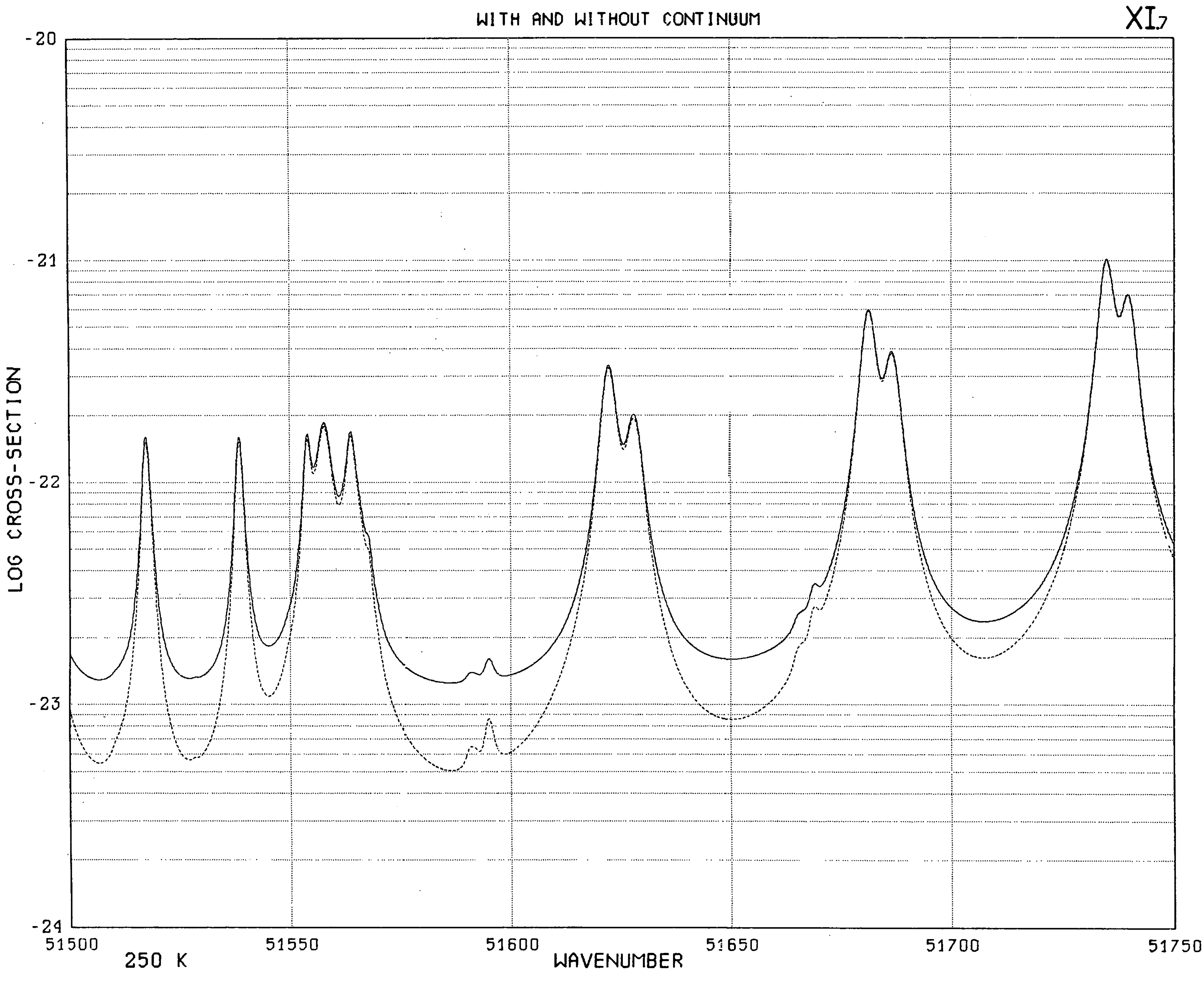


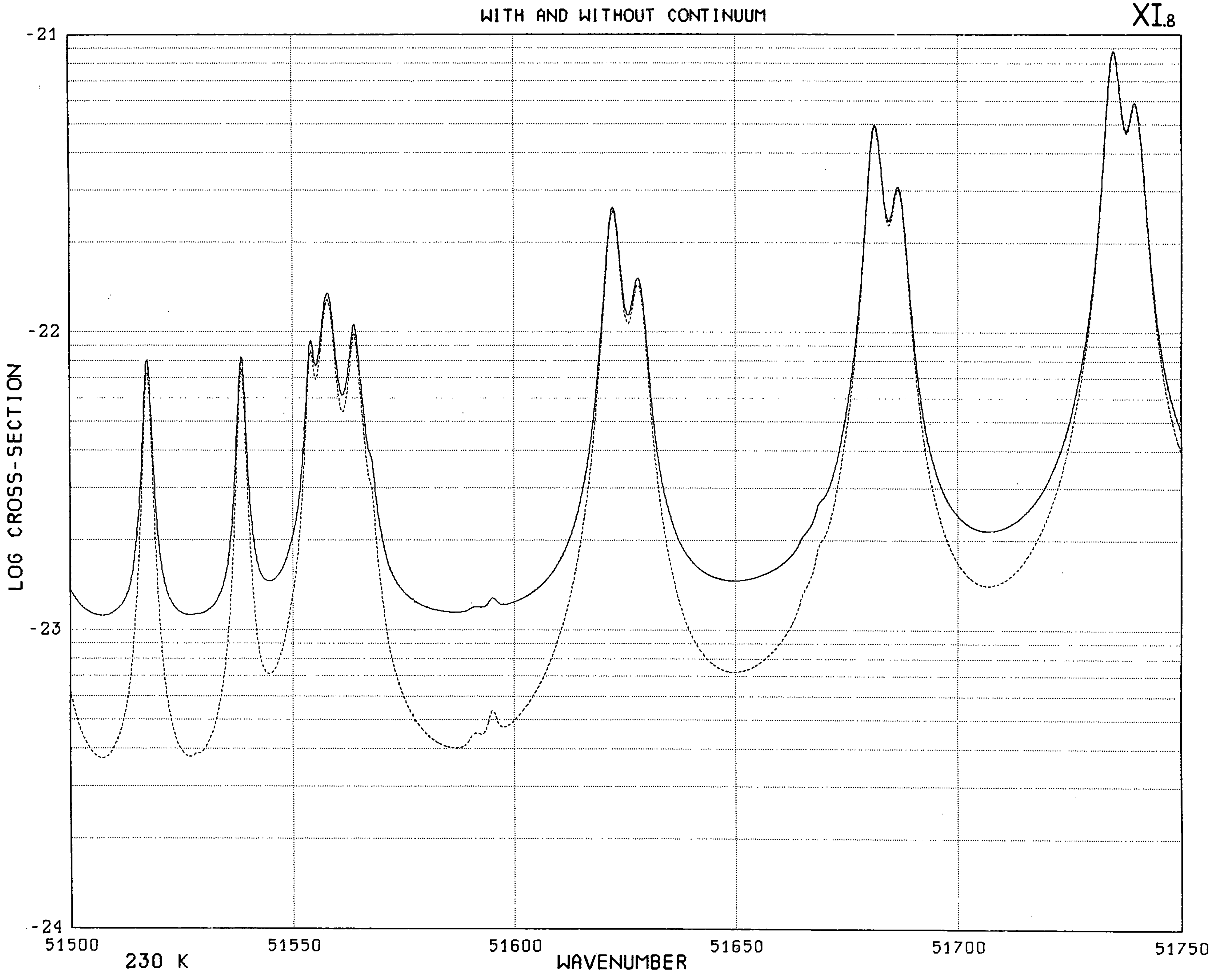

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-20
-21
-22
-23
-24
51500
51550
51600
51650
51700
51750
WAVENUMBER
300-270-230-190 K

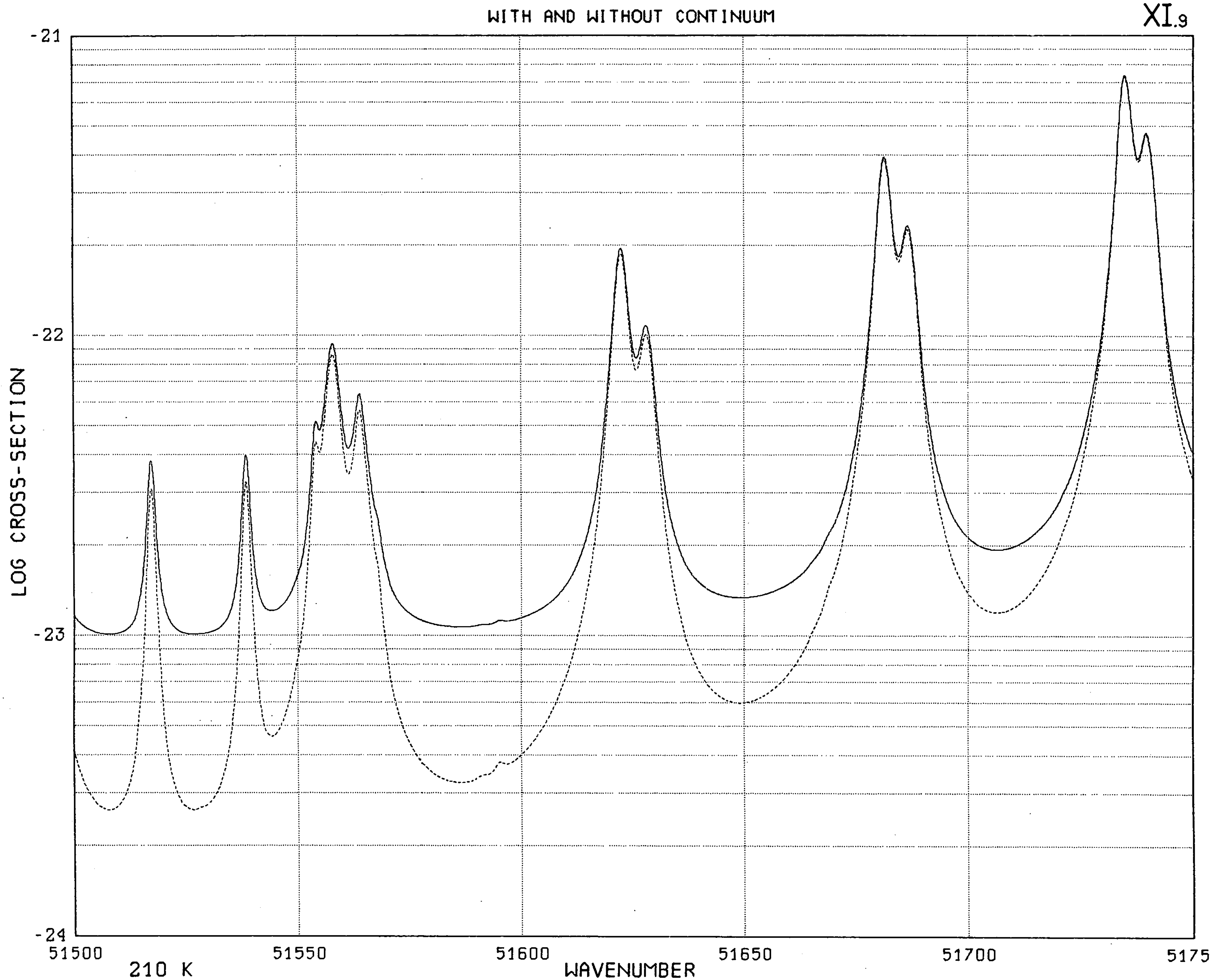


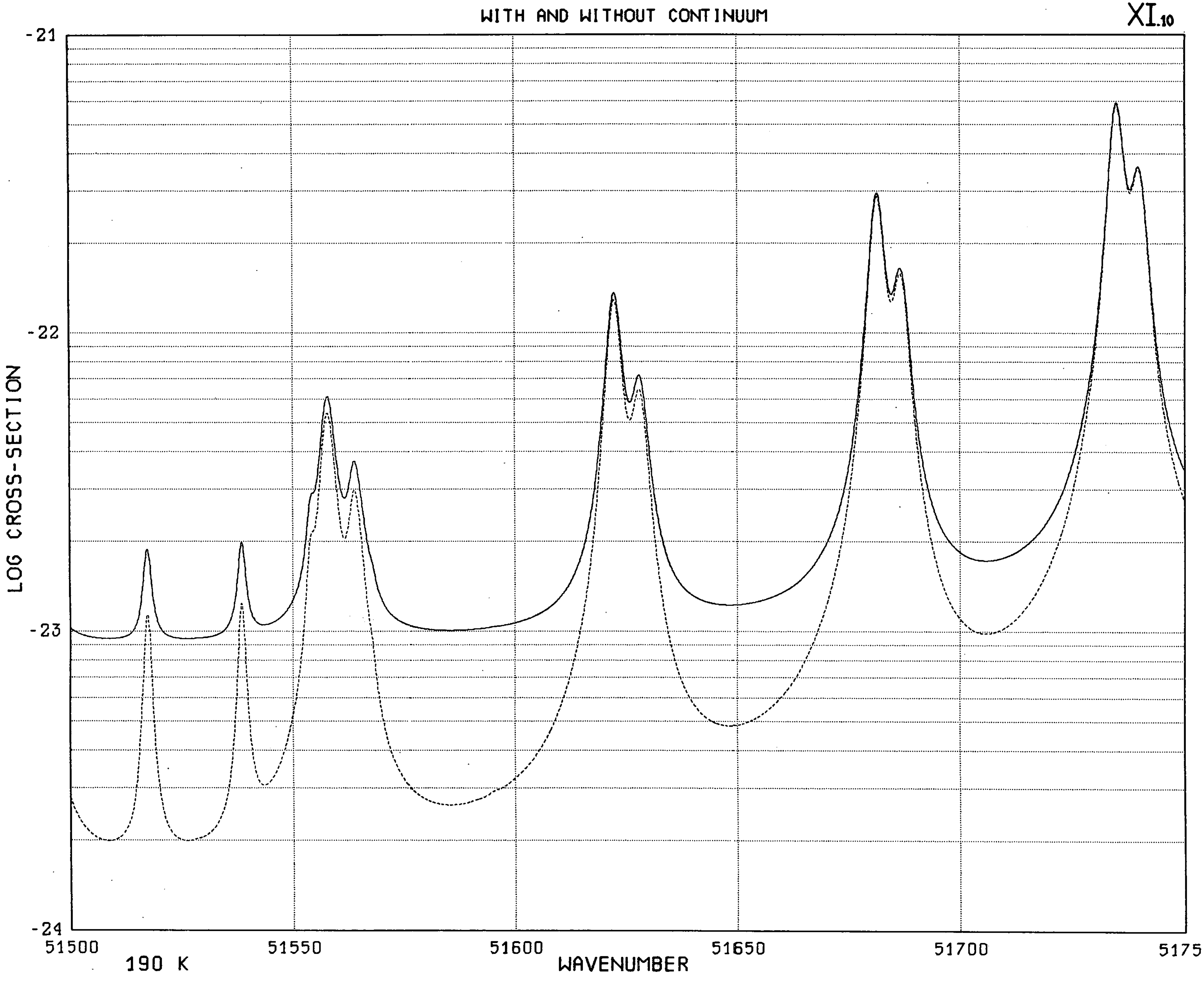
WITH AND WITHOUT CONTINUUM
XI.5
LOG CROSS-SECTION
-20
-21
-22
-23
-24
51500
51550
51600
51650
51700
51750
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51500
51550
51600
51650
51700
51750
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
XI.7
-20
-21
-22
-23
-24
LOG CROSS-SECTION
51500
51550
51600
51650
51700
51750
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
LOG CROSS-SECTION
51500
51550
51600
51650
51700
51750
230 K
WAVENUMBER

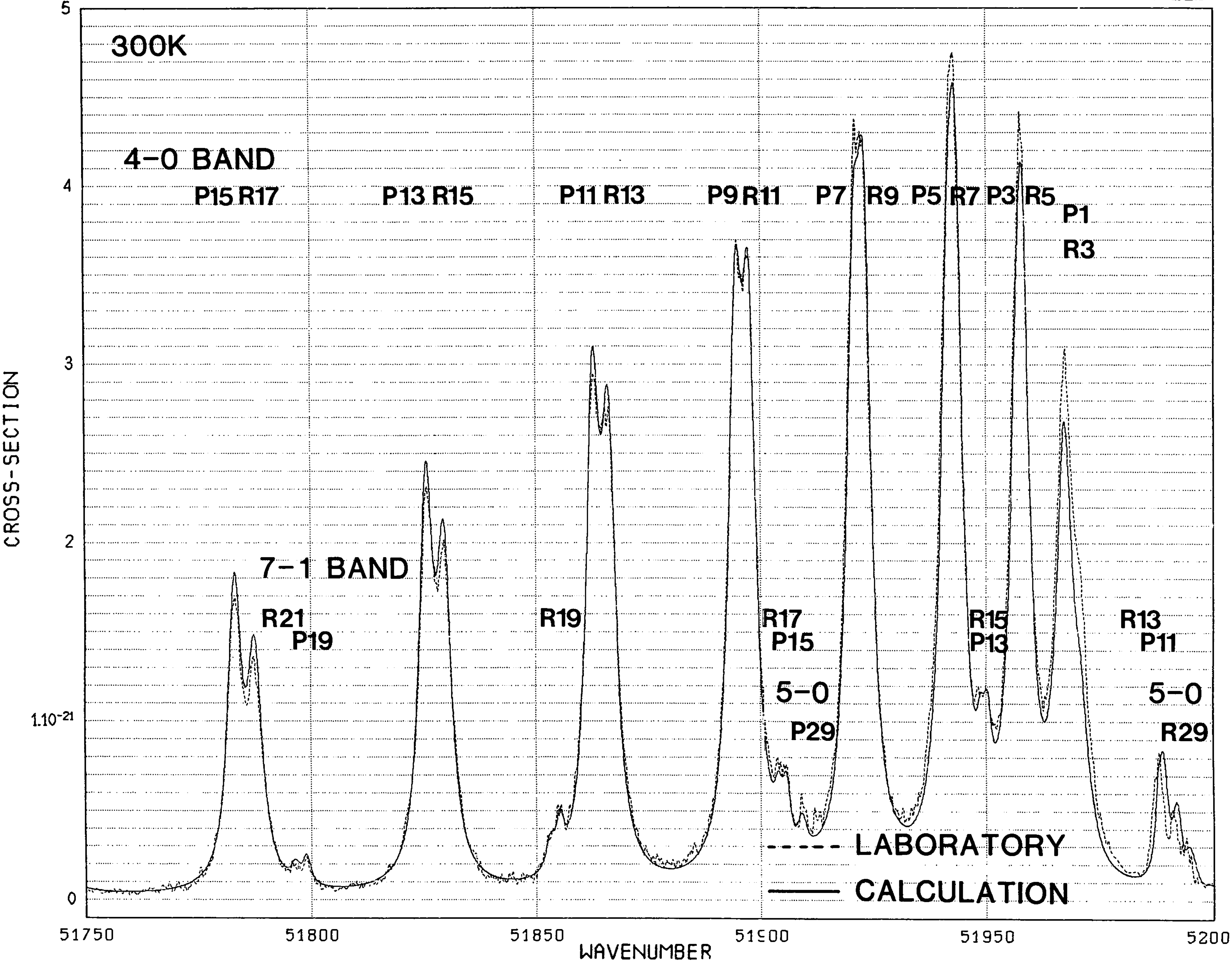

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
LOG CROSS-SECTION
51500
51550
51600
51650
51700
51750
WAVENUMBER
210 K

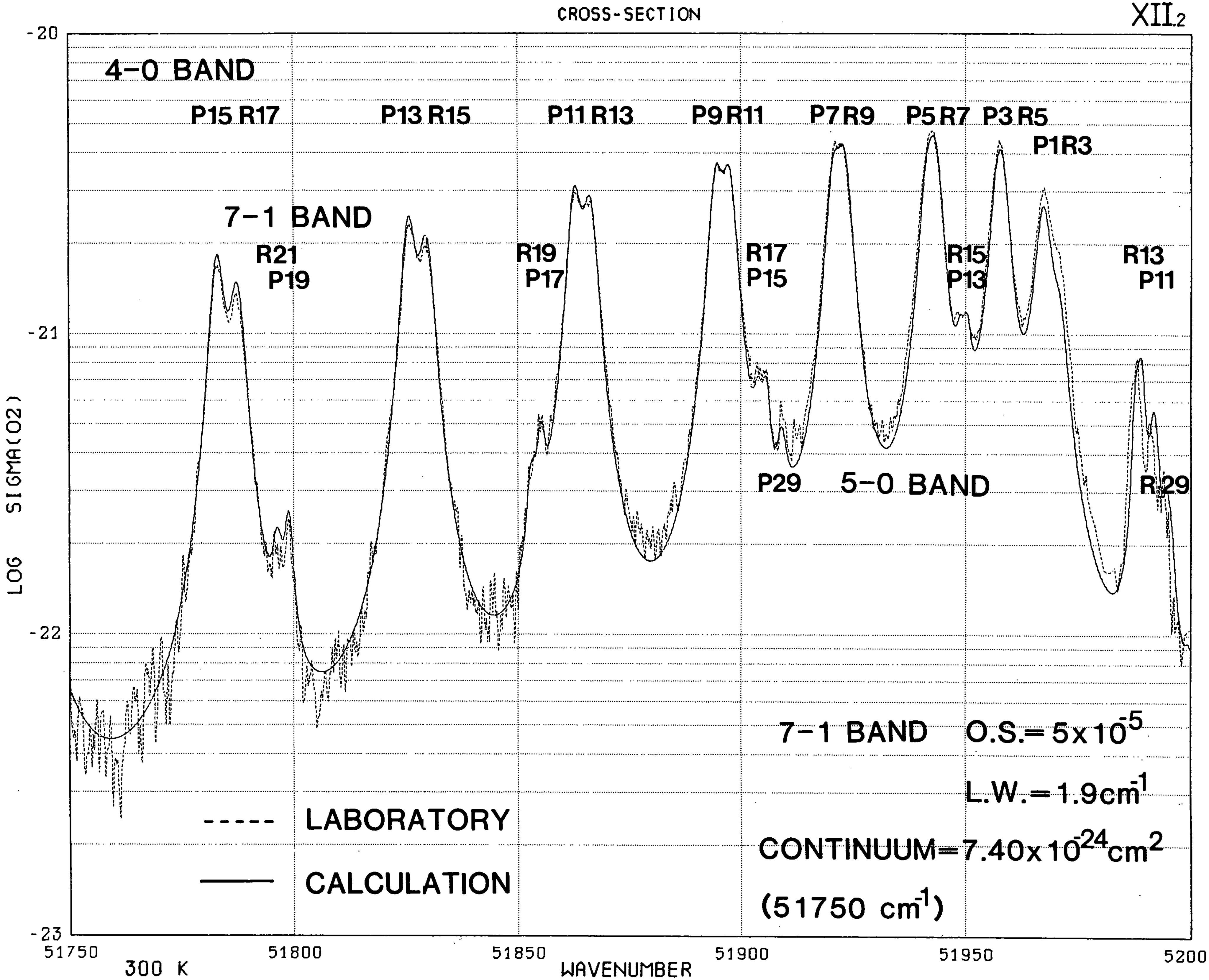

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
LOG CROSS-SECTION
51500
51550
51600
51650
51700
51750
WAVENUMBER
190 K

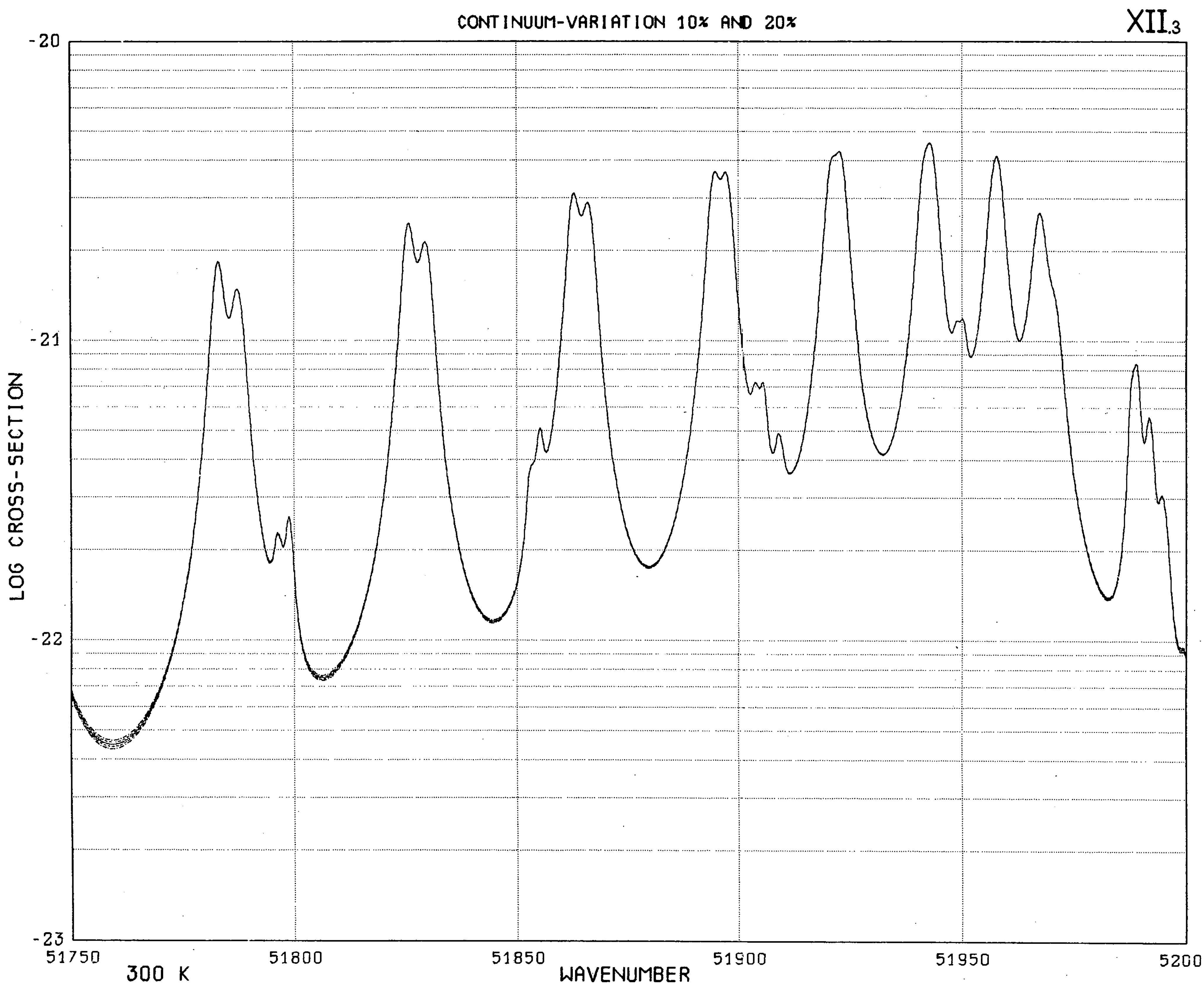
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
51750 - 52000 cm^{-1}

ν	λ	band	ν	λ	band	ν	λ	band
51750								
51782.7	1931.15	4-0 P15	51909.1	1926.45	5-0 P29	51991.7	1923.38	5-0 P27
51782.9	1931.14	4-0 P15	51909.7	1926.42	5-0 P29	51991.9	1923.38	5-0 P27
51783.4	1931.12	4-0 P15	51911.4	1926.36	8-1 P29	51992.5	1923.35	5-0 P27
51787.1	1930.98	4-0 R17	51911.9	1926.34	8-1 P29	51994.5	1923.28	5-0 R29
51787.4	1930.97	4-0 R17	51912.5	1926.32	8-1 P29	51994.9	1923.26	5-0 R29
51788.0	1930.95	4-0 R17	51920.5	1926.02	4-0 P 7	51995.7	1923.24	5-0 R29
51796.0	1930.65	7-1 R21	51920.6	1926.02	4-0 P 7	51999.3	1923.10	8-1 P27
51796.3	1930.64	7-1 R21	51920.9	1926.01	4-0 P 7	51999.7	1923.09	8-1 P27
51797.0	1930.61	7-1 R21	51922.9	1925.93	4-0 R 9			
51798.7	1930.55	7-1 P19	51923.0	1925.93	4-0 R 9			
51798.8	1930.55	7-1 P19	51923.5	1925.91	4-0 R 9			
51799.3	1930.53	7-1 P19	51941.3	1925.25	4-0 P 5			
51800			51941.3	1925.25	4-0 P 5			
51825.4	1929.56	4-0 P13	51941.7	1925.24	4-0 P 5			
51825.5	1929.55	4-0 P13	51943.1	1925.18	4-0 R 7			
51826.0	1929.54	4-0 P13	51943.2	1925.18	4-0 R 7			
51829.3	1929.41	4-0 R15	51943.6	1925.16	4-0 R 7			
51829.5	1929.40	4-0 R15	51948.6	1924.98	7-1 R15			
51830.1	1929.38	4-0 R15	51948.8	1924.97	7-1 R15			
51850			51949.3	1924.96	7-1 R15			
51852.7	1928.54	7-1 R19	51950					
51853.0	1928.53	7-1 R19	51950.2	1924.92	7-1 P13			
51853.6	1928.51	7-1 R19	51950.3	1924.92	7-1 P13			
51855.0	1928.46	7-1 P17	51950.6	1924.90	7-1 P13			
51855.1	1928.45	7-1 P17	51956.6	1924.68	4-0 P 3			
51855.5	1928.43	7-1 P17	51956.6	1924.68	4-0 P 3			
51862.6	1928.17	4-0 P11	51957.1	1924.67	4-0 P 3			
51862.6	1928.17	4-0 P11	51957.9	1924.64	4-0 R 5			
51863.1	1928.15	4-0 P11	51957.9	1924.63	4-0 R 5			
51865.9	1928.05	4-0 R13	51958.4	1924.62	4-0 R 5			
51866.1	1928.04	4-0 R13	51966.4	1924.32	4-0 P 1			
51866.7	1928.02	4-0 R13	51967.2	1924.29	4-0 R 3			
51894.3	1926.99	4-0 P 9	51967.2	1924.29	4-0 R 3			
51894.3	1926.99	4-0 P 9	51967.6	1924.27	4-0 R 3			
51894.7	1926.98	4-0 P 9	51969.4	1924.21	4-0 Q 1			
51897.1	1926.89	4-0 R11	51971.0	1924.15	4-0 R 1			
51897.3	1926.88	4-0 R11	51971.0	1924.15	4-0 R 1			
51897.8	1926.86	4-0 R11	51987.8	1923.53	7-1 R13			
51900			51987.9	1923.52	7-1 R13			
51903.6	1926.65	7-1 R17	51988.4	1923.51	7-1 R13			
51903.8	1926.64	7-1 R17	51989.1	1923.48	7-1 P11			
51904.3	1926.62	7-1 R17	51989.1	1923.48	7-1 P11			
51905.5	1926.58	7-1 P15	51989.5	1923.47	7-1 P11			
51905.6	1926.57	7-1 P15	51989.7	1923.46	8-1 R29			
51906.0	1926.56	7-1 P15	51990.4	1923.43	8-1 R29			
51908.9	1926.45	5-0 P29	51991.2	1923.40	8-1 R29			

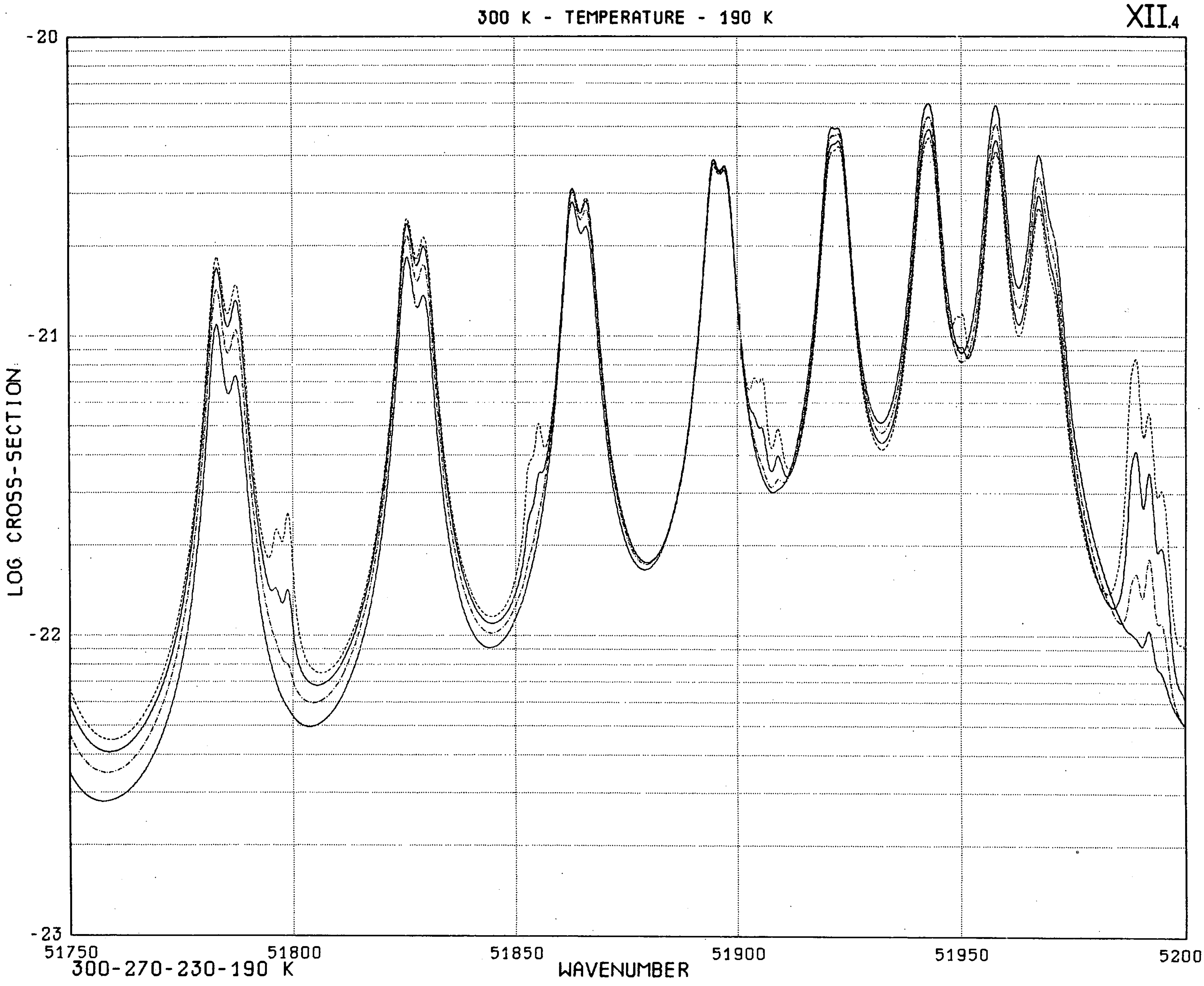
IDENTIFICATION

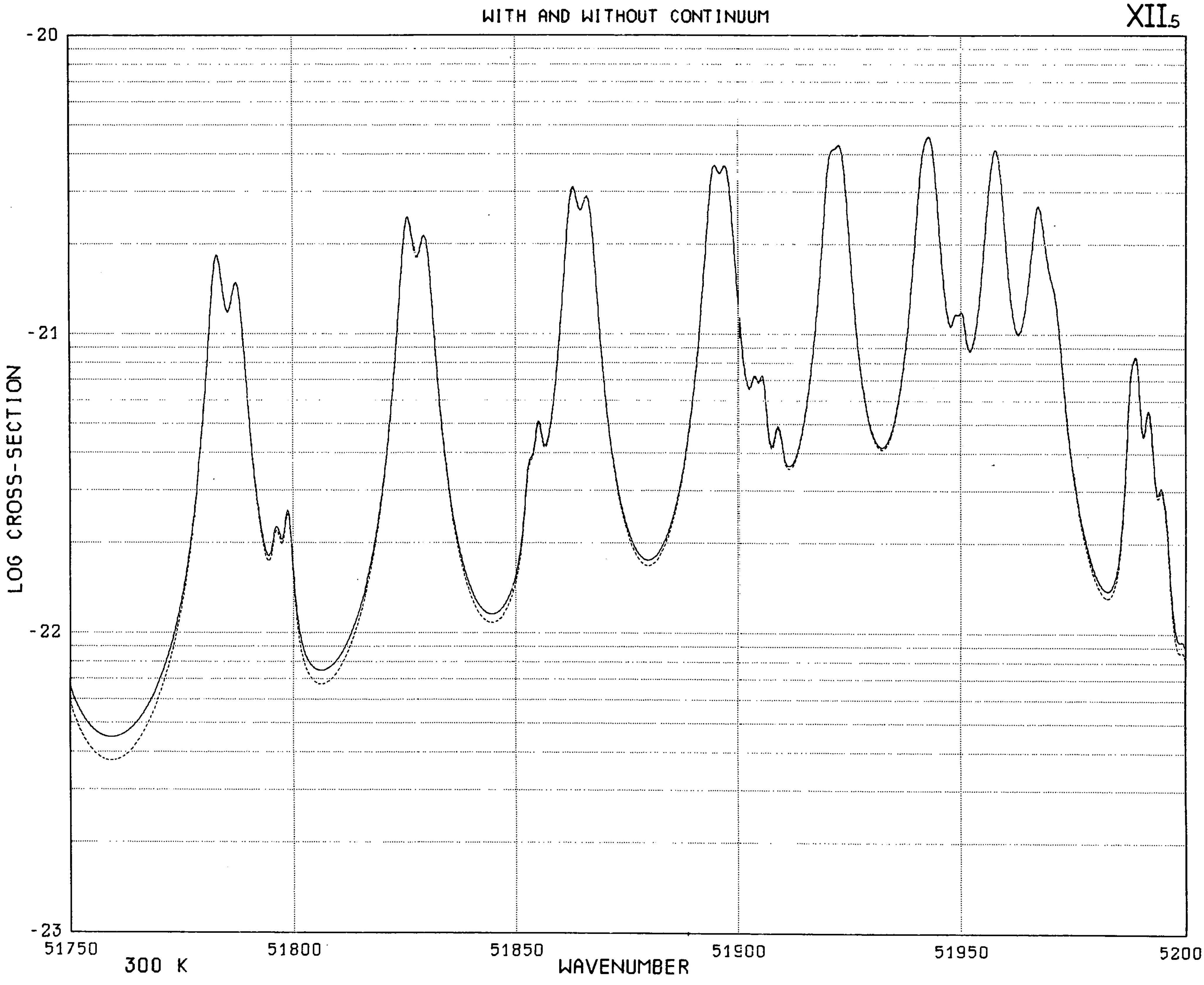


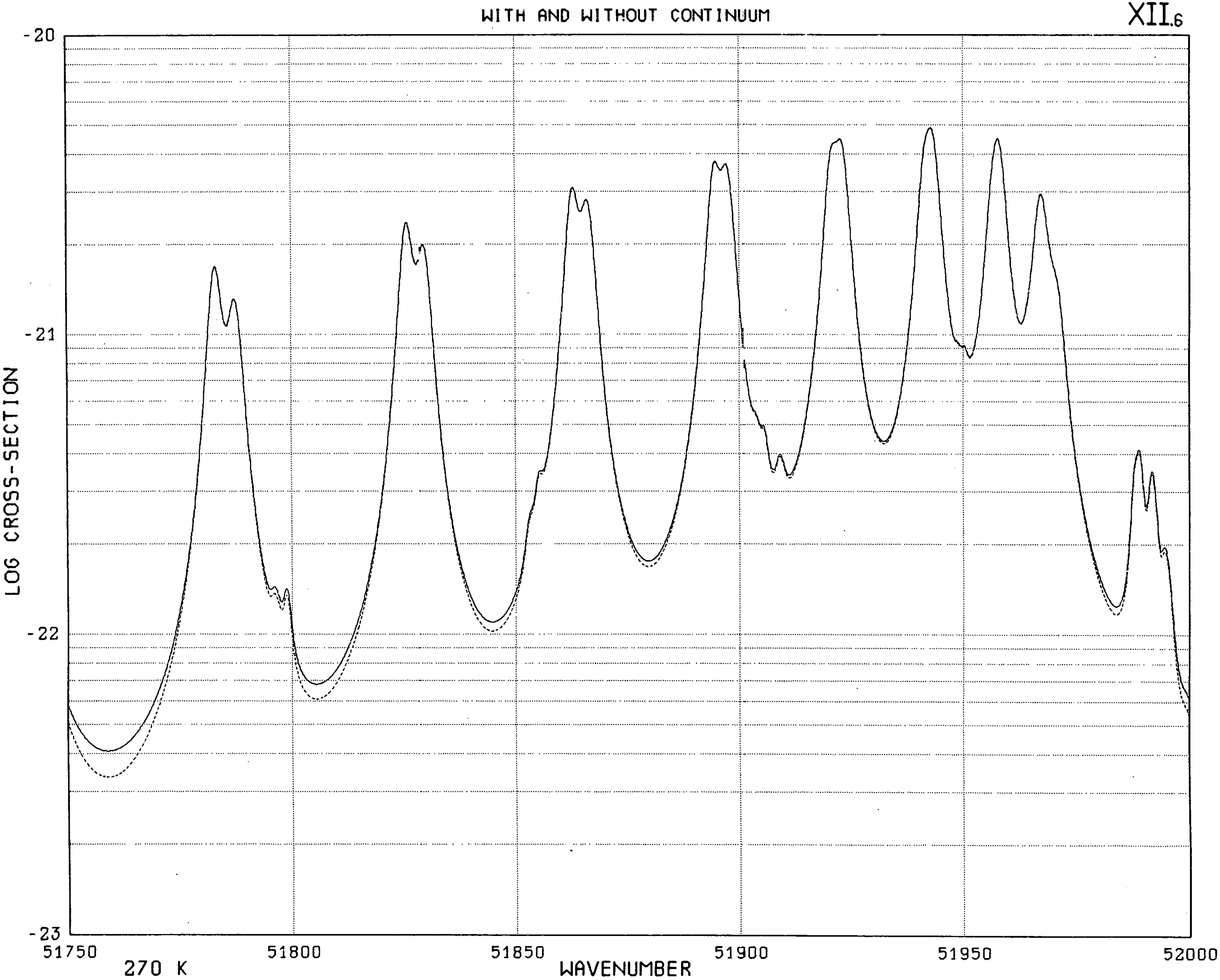

CROSS-SECTION
4-0 BAND
P15 R17
P13 R15
P11 R13
P9 R11
P7 R9
P5 R7
P3 R5
P1 R3
7-1 BAND
R21
P19
R19
P17
R17
P15
R15
P13
R13
P11
P29
5-0 BAND
R29
-20
-21
-22
-23
LOG SIGMA(O2)
51750
51800
51850
51900
51950
52000
300 K
WAVENUMBER
LABORATORY
CALCULATION
7-1 BAND O.S.=5x10-5
L.W.=1.9cm-1
CONTINUUM=7.40x10-24cm2
(51750 cm-1)

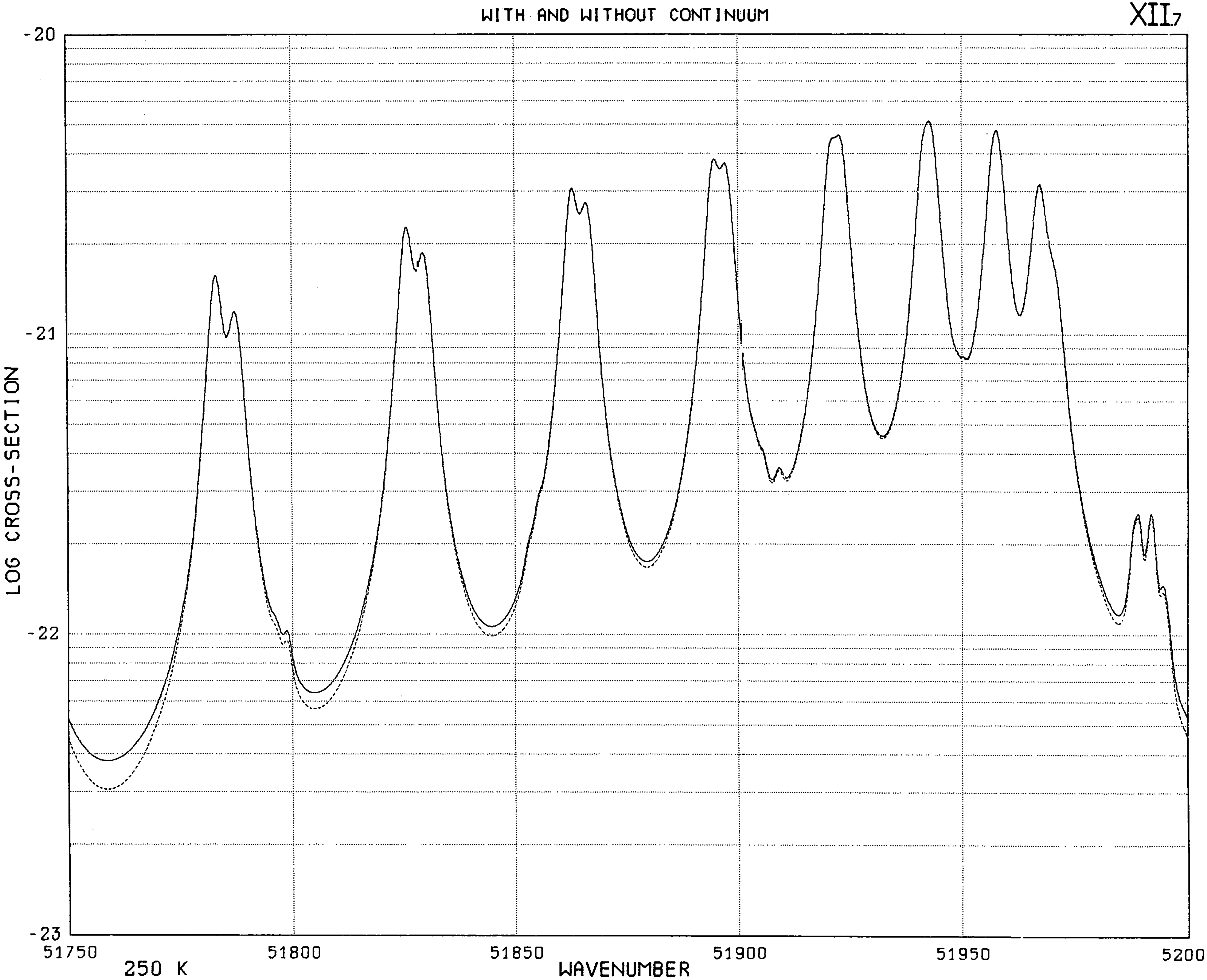


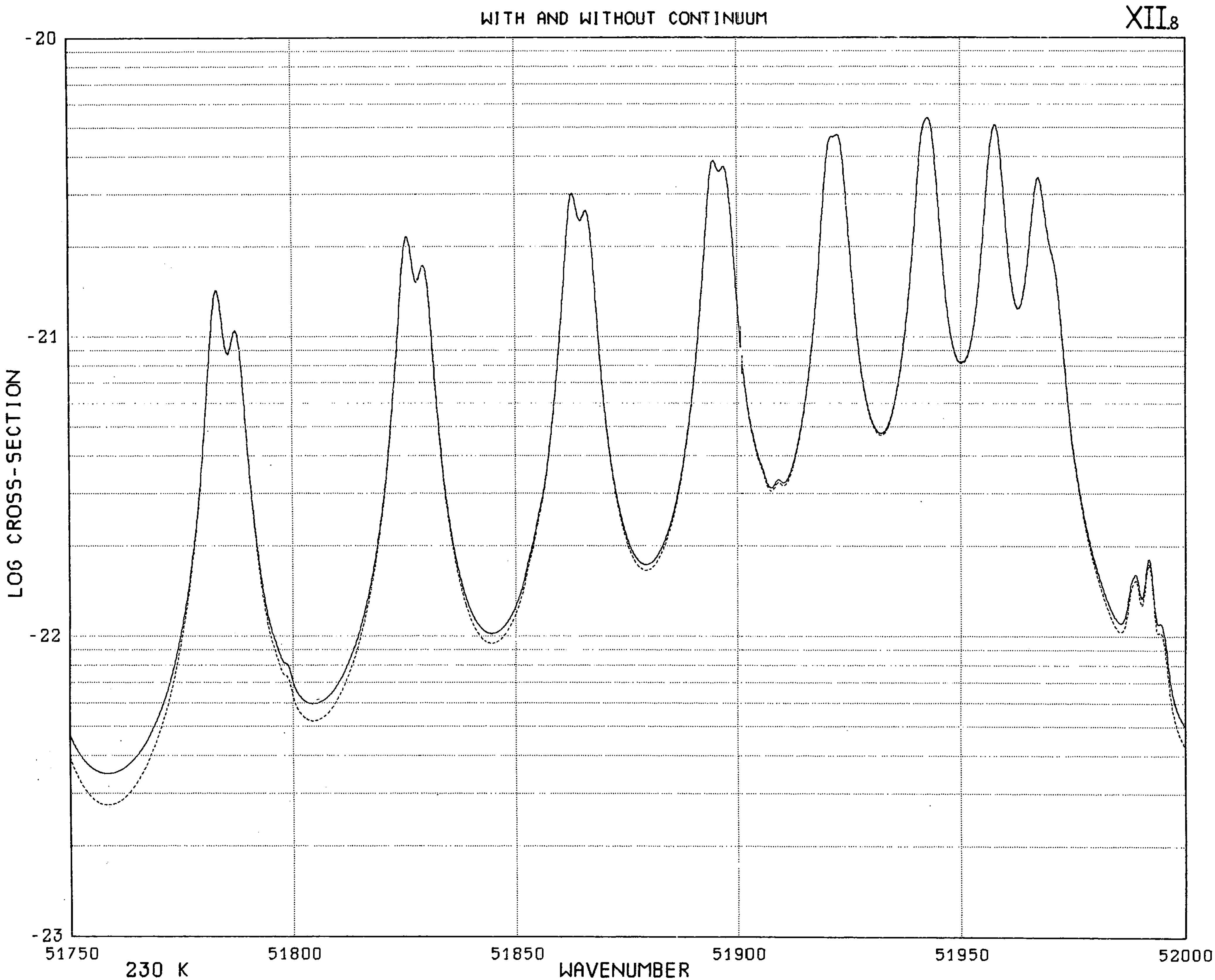
CONTINUUM-VARIATION 10% AND 20%
XII.3
LOG CROSS-SECTION
-20
-21
-22
-23
51750
51800
51850
51900
51950
52000
300 K
WAVENUMBER

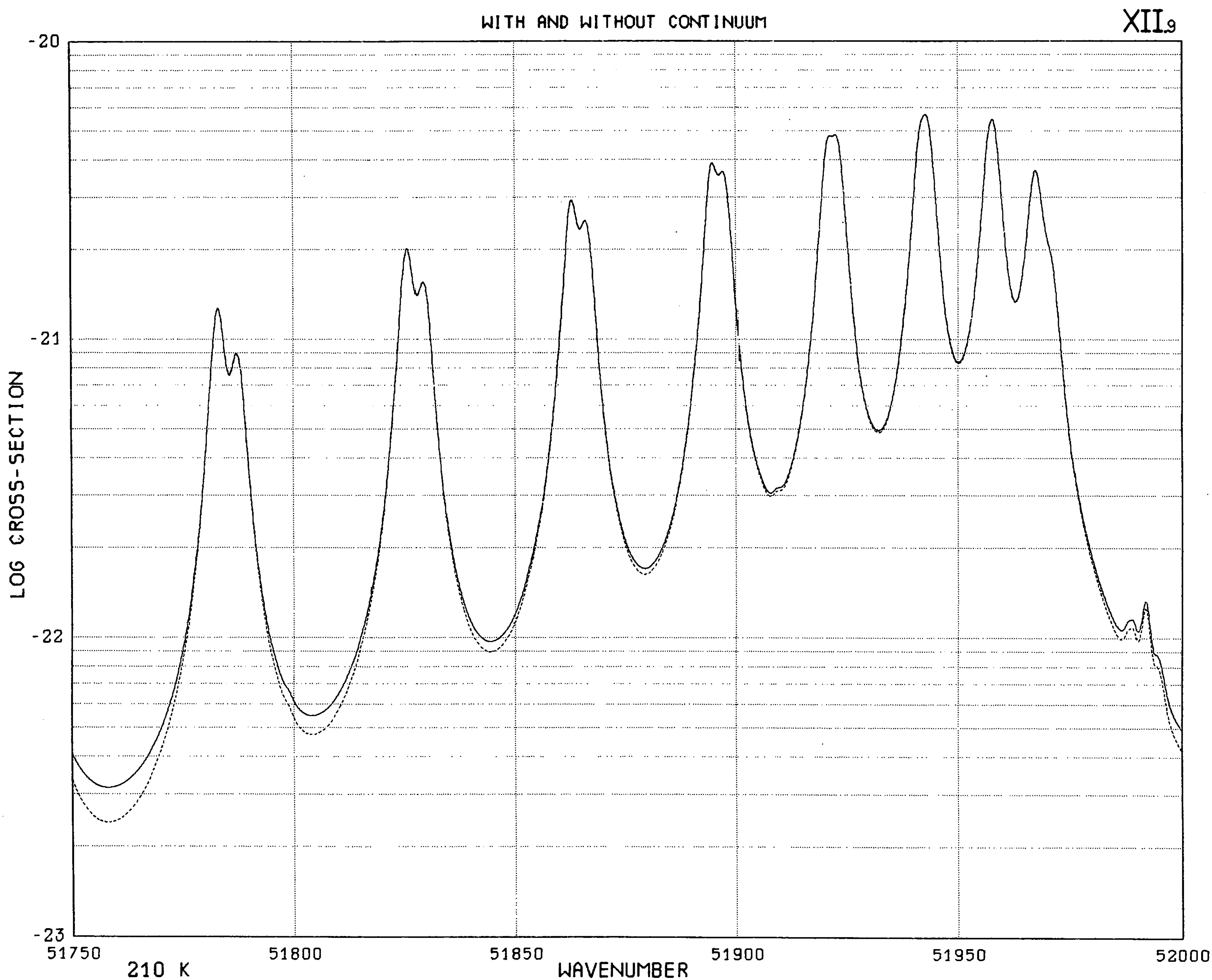

300 K - TEMPERATURE - 190 K
-20
-21
-22
-23
LOG CROSS-SECTION
51750
51800
51850
51900
51950
52000
300-270-230-190 K
WAVENUMBER

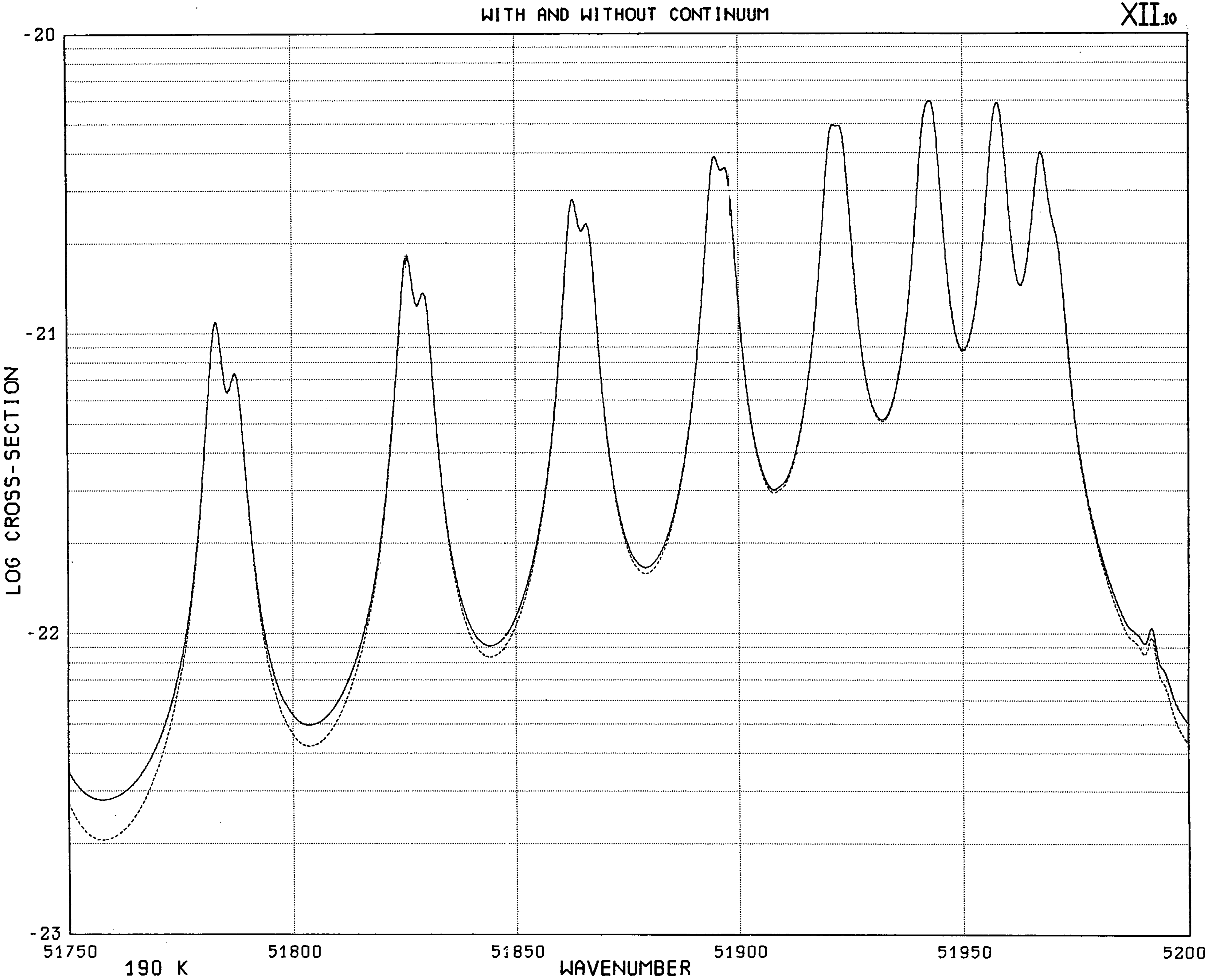

WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
LOG CROSS-SECTION
51750
51800
51850
51900
51950
52000
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
LOG CROSS-SECTION
51750
51800
51850
51900
51950
52000
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
LOG CROSS-SECTION
51750
51800
51850
51900
51950
52000
WAVENUMBER
250 K

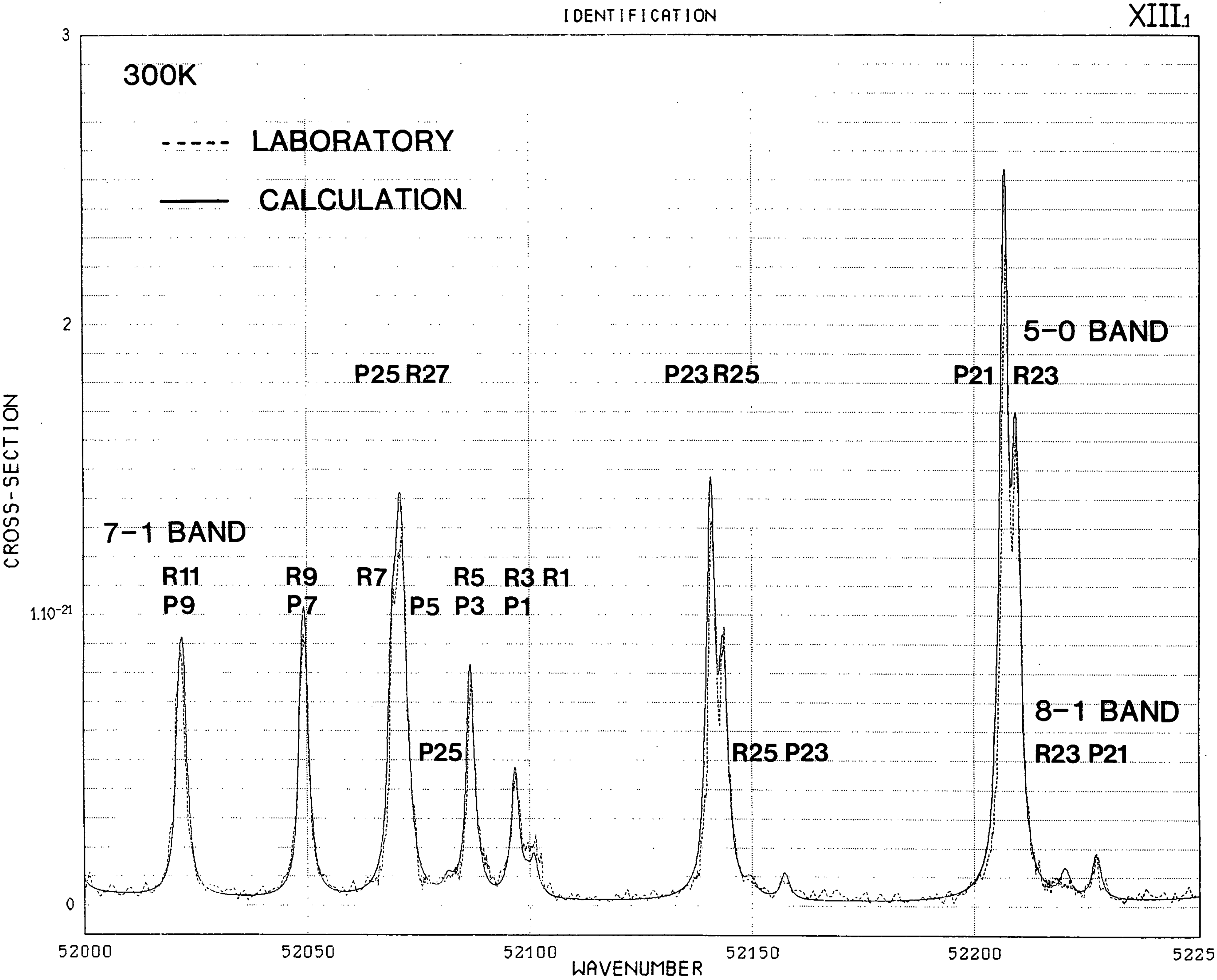

WITH AND WITHOUT CONTINUUM
XII.8
-20
-21
-22
-23
LOG CROSS-SECTION
51750
51800
51850
51900
51950
52000
230 K
WAVENUMBER

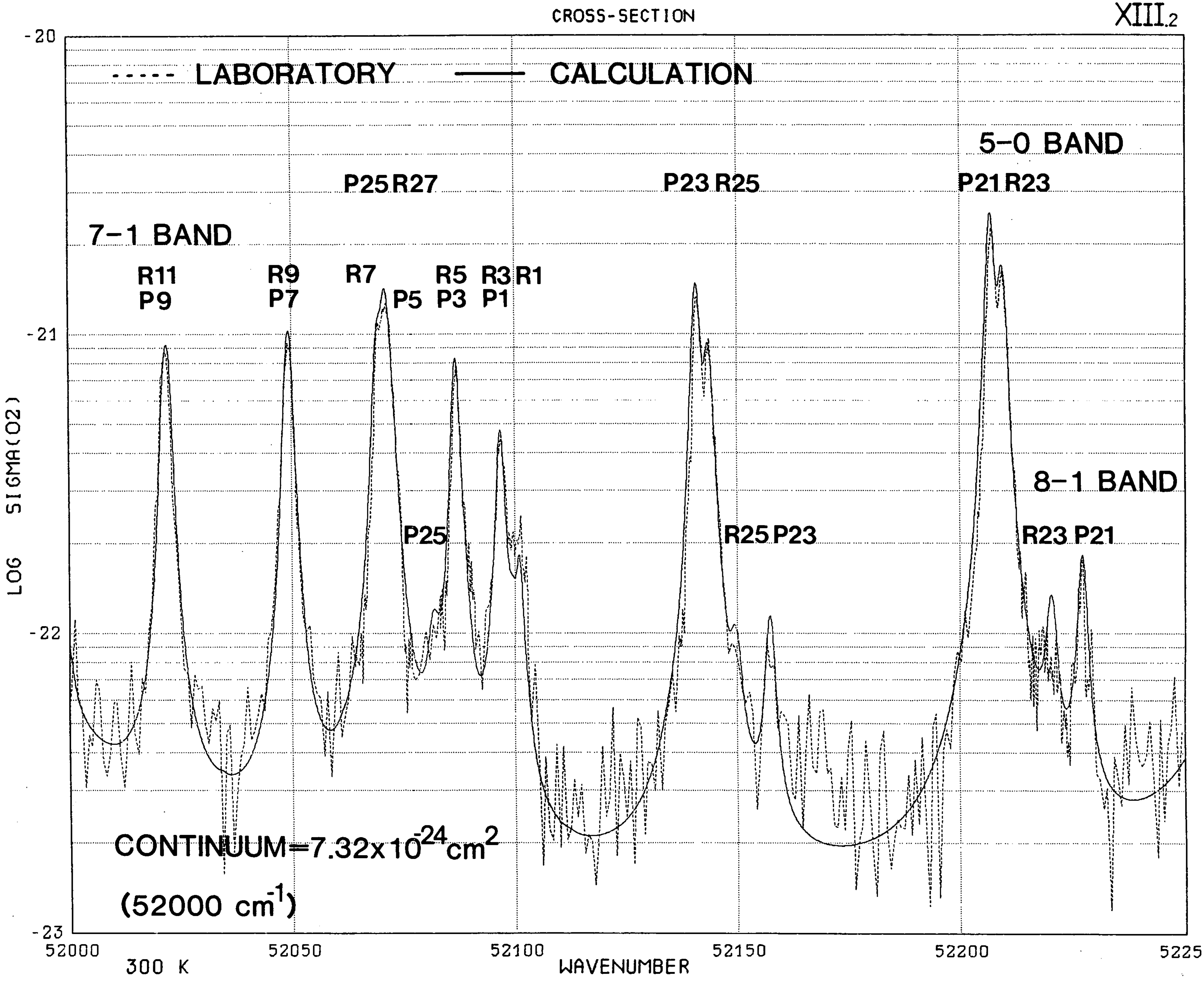

WITH AND WITHOUT CONTINUUM
XII9
-20
-21
-22
-23
LOG CROSS-SECTION
51750
51800
51850
51900
51950
52000
210 K
WAVENUMBER

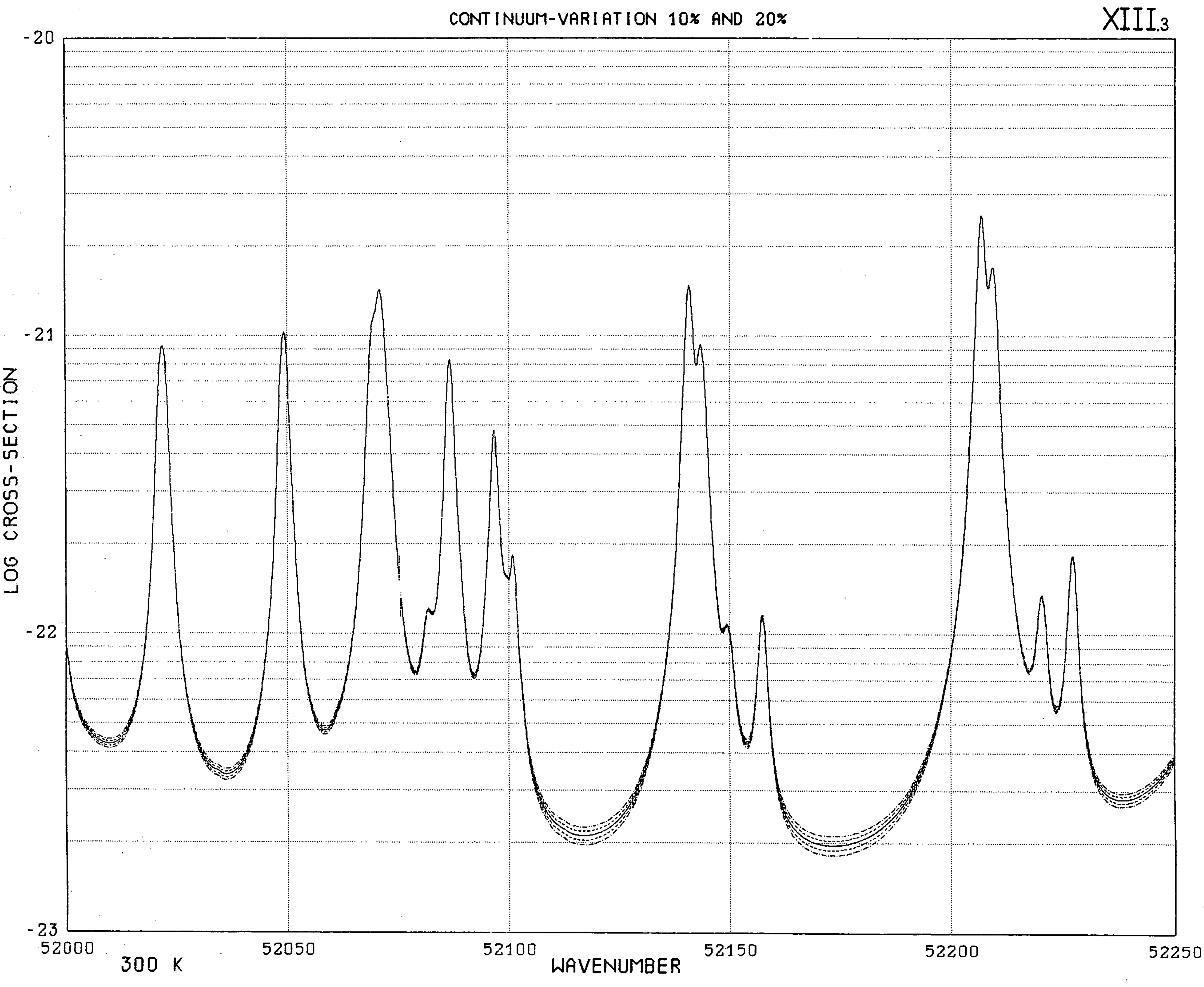

WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
LOG CROSS-SECTION
51750
51800
51850
51900
51950
52000
190 K
WAVENUMBER

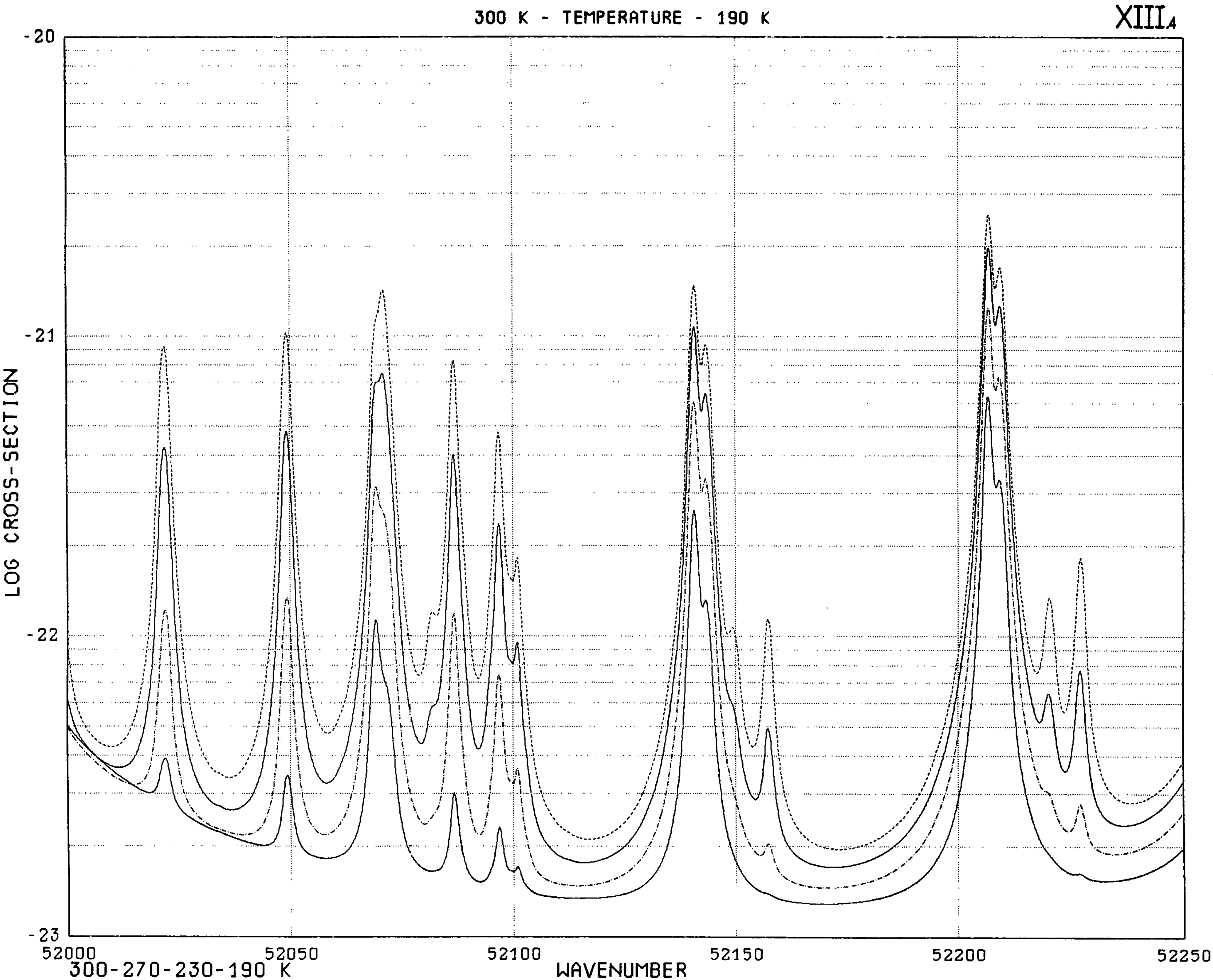
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
52000 - 52250 cm^{-1}

ν	λ	band
52000		
52000.3	1923.07	8-1 P27
52021.2	1922.29	7-1 R11
52021.3	1922.29	7-1 R11
52021.7	1922.27	7-1 R11
52022.2	1922.26	7-1 P 9
52022.2	1922.26	7-1 P 9
52022.6	1922.24	7-1 P 9
52048.8	1921.28	7-1 R 9
52048.8	1921.27	7-1 R 9
52049.2	1921.26	7-1 R 9
52049.5	1921.25	7-1 P 7
52049.6	1921.25	7-1 P 7
52049.9	1921.23	7-1 P 7
52050		
52068.9	1920.53	5-0 P25
52069.1	1920.53	5-0 P25
52069.6	1920.51	5-0 P25
52070.5	1920.47	7-1 R 7
52070.5	1920.47	7-1 R 7
52070.9	1920.46	7-1 R 7
52071.1	1920.45	7-1 P 5
52071.1	1920.45	7-1 P 5
52071.5	1920.44	7-1 P 5
52071.7	1920.43	5-0 R27
52072.0	1920.42	5-0 R27
52072.5	1920.40	8-1 R27
52072.8	1920.39	5-0 R27
52073.1	1920.38	8-1 R27
52073.8	1920.35	8-1 R27
52081.2	1920.08	8-1 P25
52081.6	1920.07	8-1 P25
52082.1	1920.05	8-1 P25
52086.5	1919.88	7-1 R 5
52086.5	1919.88	7-1 R 5
52086.9	1919.87	7-1 P 3
52086.9	1919.87	7-1 P 3
52086.9	1919.87	7-1 R 5
52087.4	1919.85	7-1 P 3
52096.7	1919.51	7-1 R 3
52096.7	1919.51	7-1 R 3
52096.8	1919.51	7-1 P 1
52097.1	1919.49	7-1 R 3
52099.5	1919.40	7-1 Q 1
52100		
52101.0	1919.35	7-1 R 1
52101.1	1919.35	7-1 R 1
52140.5	1917.89	5-0 P23
52140.6	1917.89	5-0 P23
52141.2	1917.87	5-0 P23
52143.3	1917.79	5-0 R25
52143.5	1917.78	5-0 R25
52144.3	1917.76	5-0 R25
52149.2	1917.57	8-1 R25
52149.7	1917.55	8-1 R25
52150		
52150.4	1917.53	8-1 R25
52157.1	1917.29	8-1 P23
52157.4	1917.27	8-1 P23
52157.9	1917.26	8-1 P23
52200		
52206.5	1915.47	5-0 P21
52206.6	1915.47	5-0 P21
52207.1	1915.45	5-0 P21
52209.1	1915.37	5-0 R23
52209.4	1915.37	5-0 R23
52210.0	1915.34	5-0 R23
52219.9	1914.98	8-1 R23
52220.4	1914.96	8-1 R23
52221.0	1914.94	8-1 R23
52227.0	1914.72	8-1 P21
52227.3	1914.71	8-1 P21
52227.7	1914.69	8-1 P21

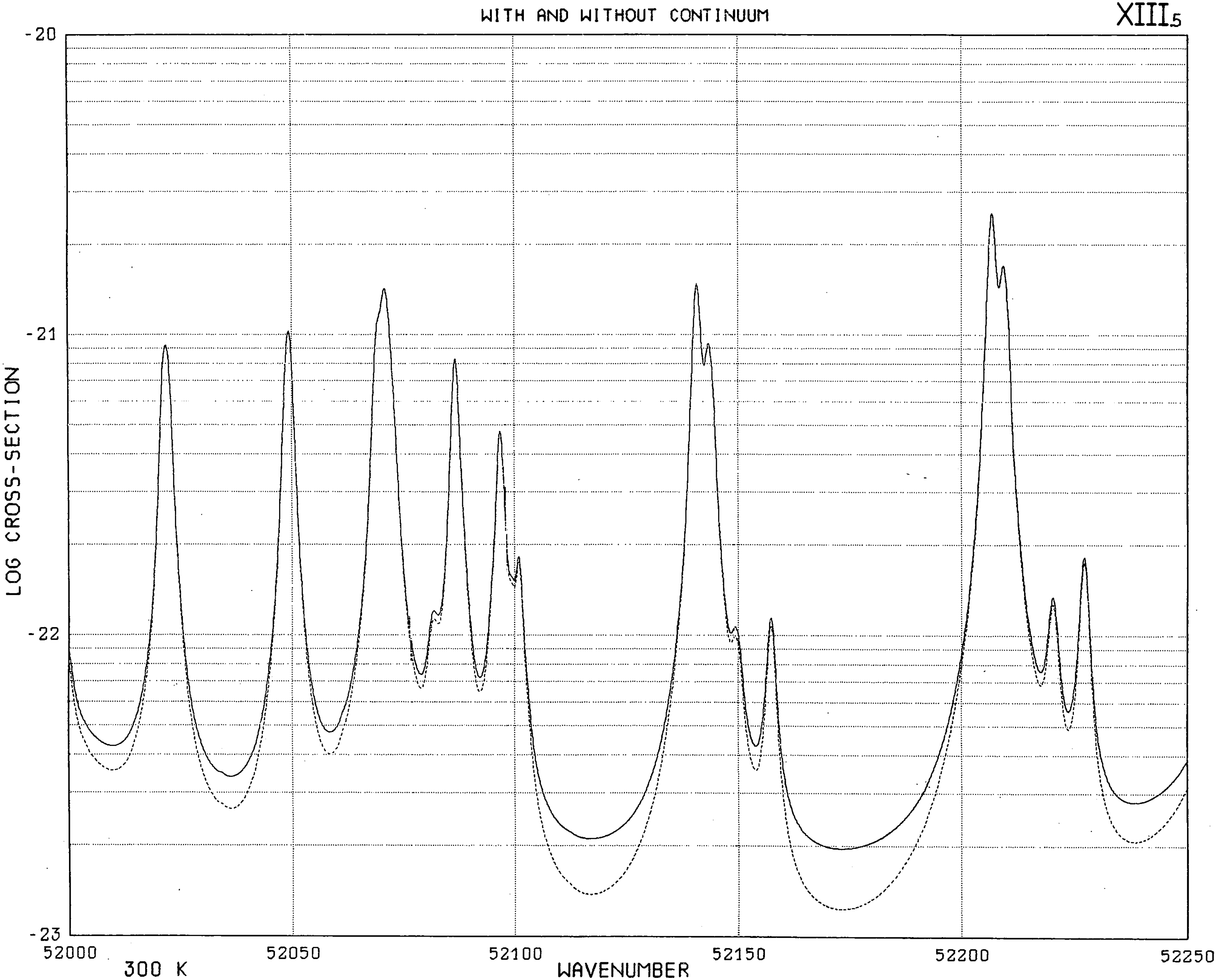

IDENTIFICATION
300K
LABORATORY
CALCULATION
7-1 BAND
R11
P9
R9
P7
R7
P25 R27
P5
P25
R5
P3
R3 R1
P1
P23 R25
R25 P23
5-0 BAND
P21
R23
8-1 BAND
R23 P21
CROSS-SECTION
3
2
1.10-21
0
52000
52050
52100
52150
52200
52250
WAVENUMBER

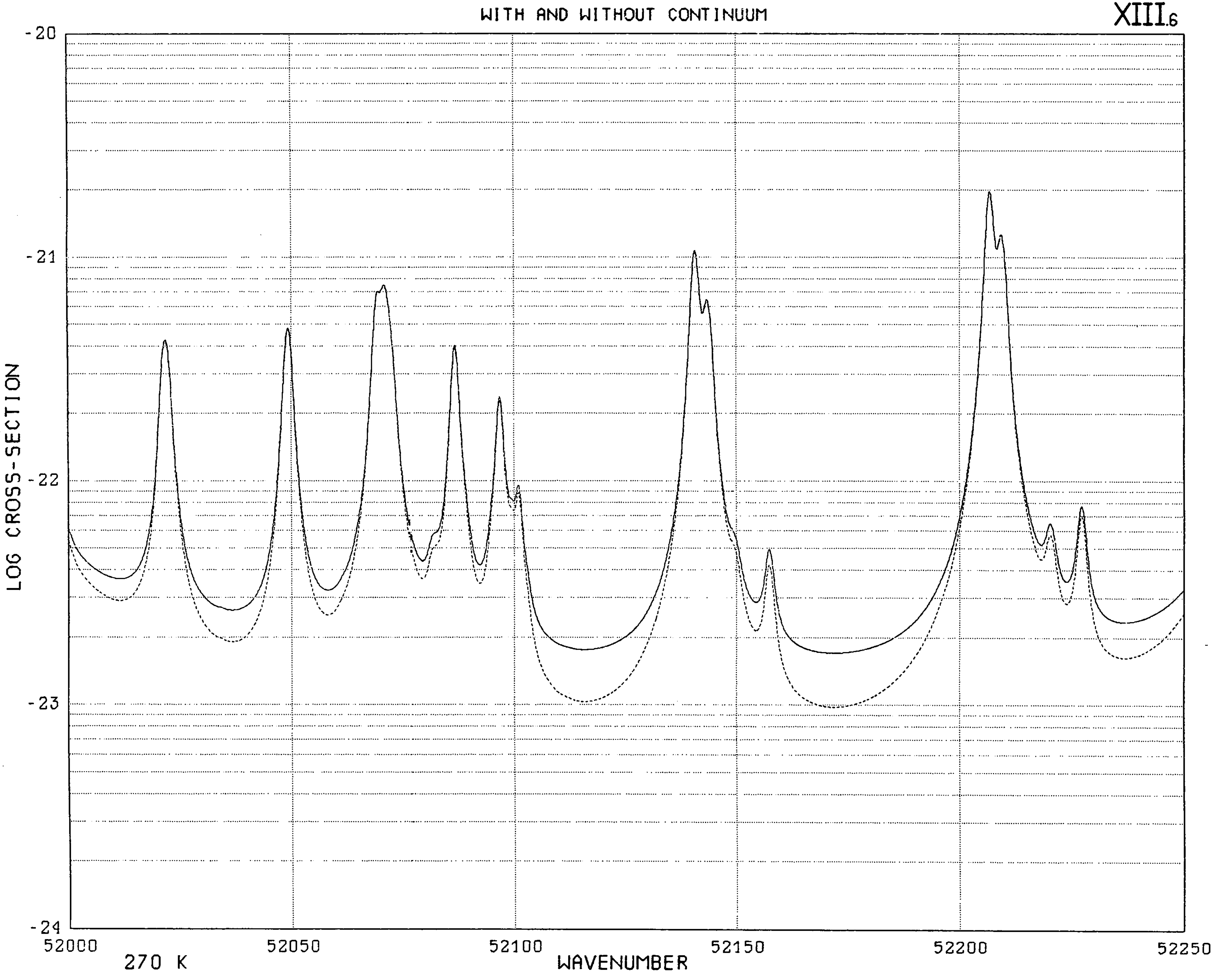

CROSS-SECTION
LABORATORY
CALCULATION
7-1 BAND
R11 P9
R9 P7
P25 R27
R7
P5
R5 P3
R3 R1 P1
P25
P23 R25
R25 P23
5-0 BAND
P21 R23
8-1 BAND
R23 P21
CONTINUUM=7.32x10-24cm2
(52000 cm-1)
LOG SIGMA(O2)
-20
-21
-22
-23
52000
52050
52100
52150
52200
52250
300 K
WAVENUMBER

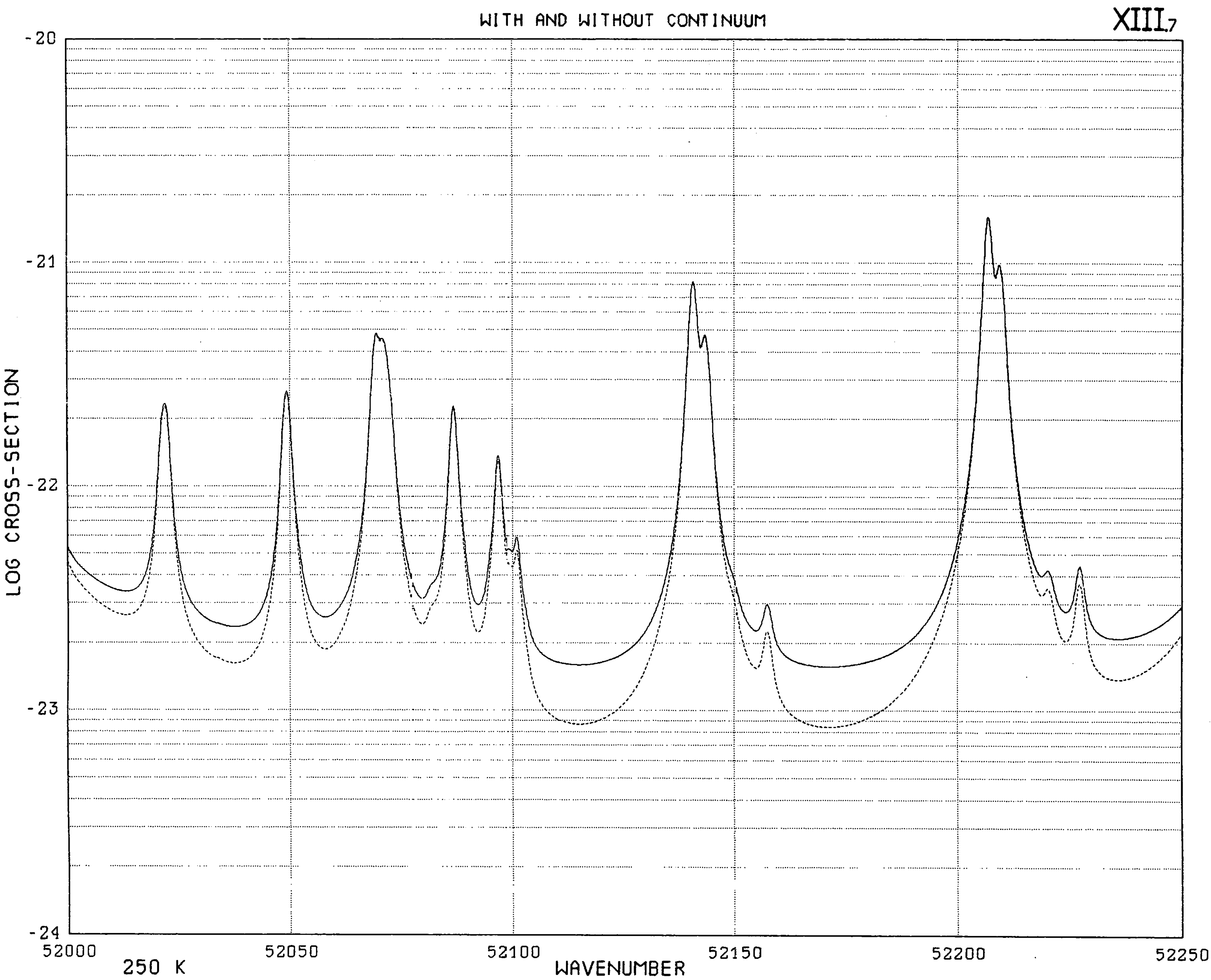

CONTINUUM-VARIATION 10% AND 20%
-20
-21
-22
-23
LOG CROSS-SECTION
52000
52050
52100
52150
52200
52250
300 K
WAVENUMBER

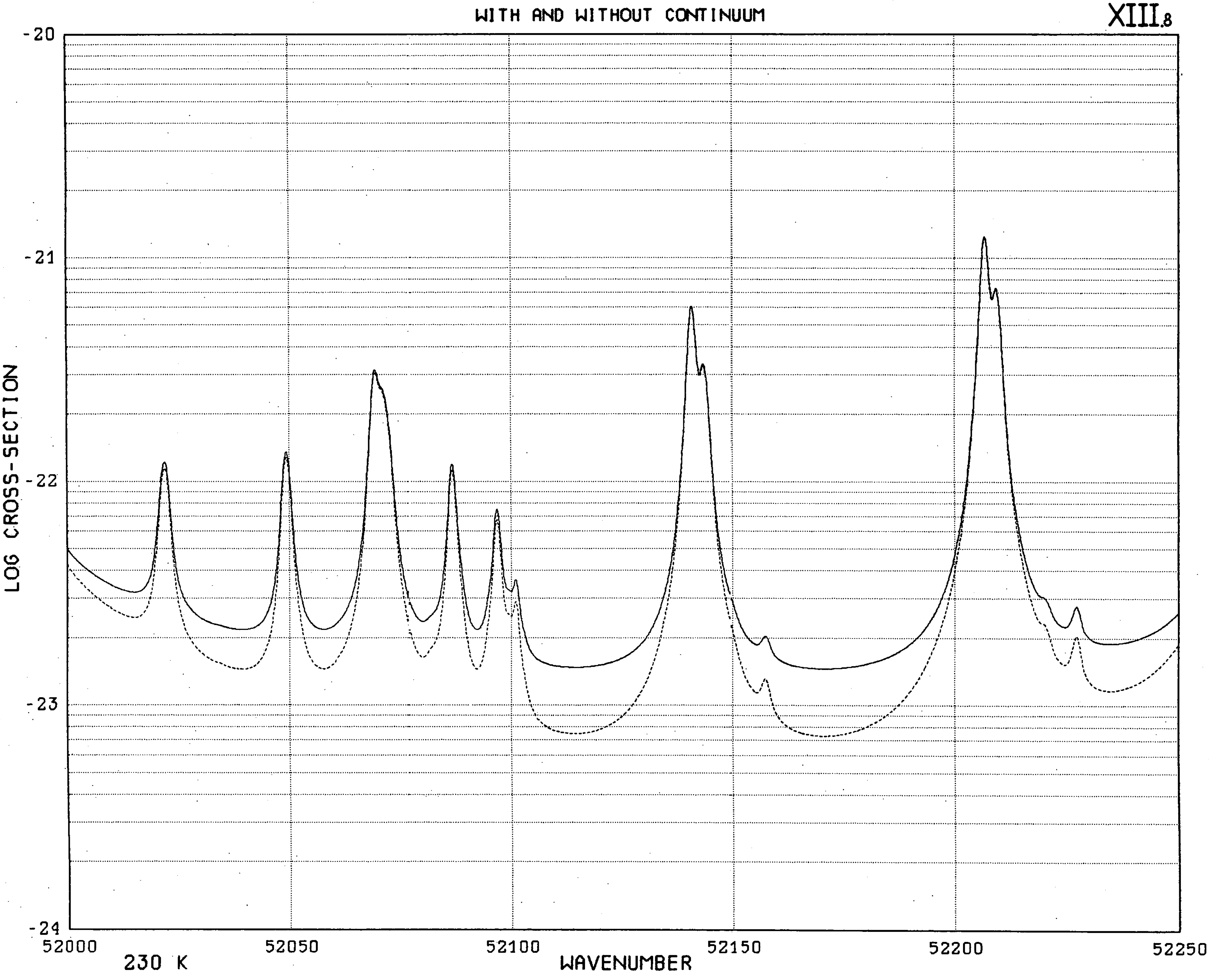


300 K - TEMPERATURE - 190 K
XIII$_A$
LOG CROSS-SECTION
-20
-21
-22
-23
52000
52050
52100
52150
52200
52250
WAVENUMBER
300-270-230-190 K

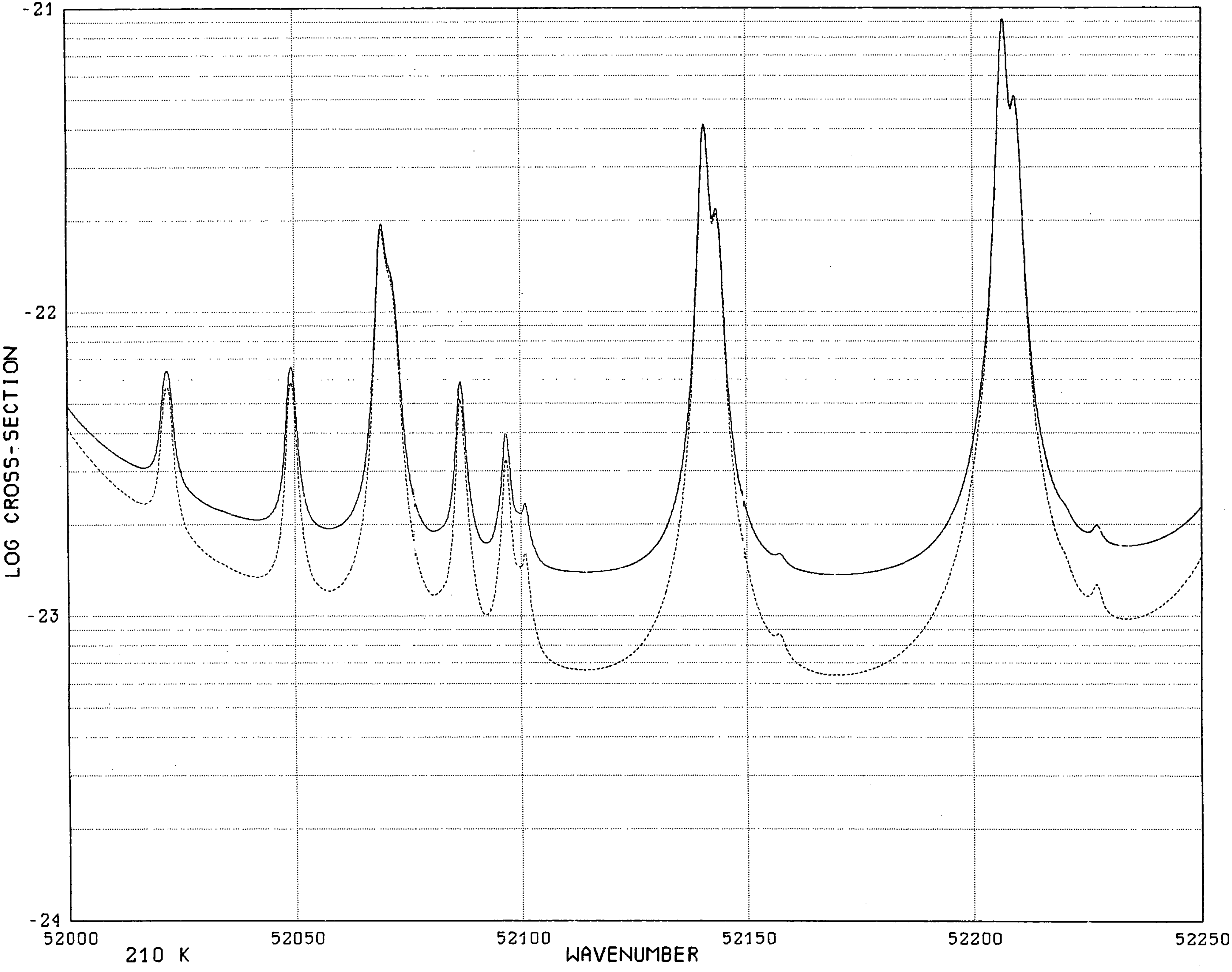

WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
LOG CROSS-SECTION
52000
52050
52100
52150
52200
52250
300 K
WAVENUMBER

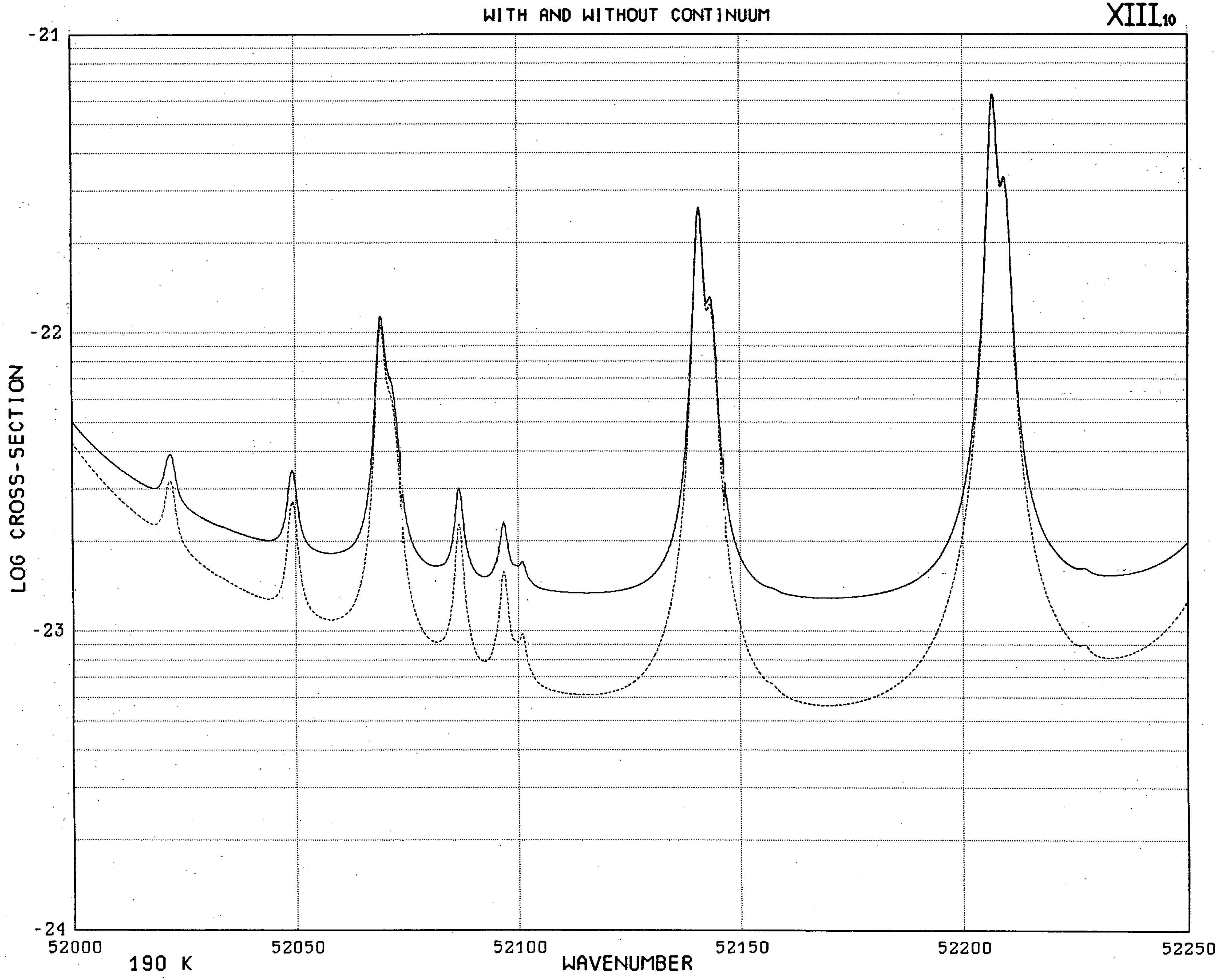

WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
-24
LOG CROSS-SECTION
52000
52050
52100
52150
52200
52250
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-20
-21
-22
-23
-24
52000
52050
52100
52150
52200
52250
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-20
-21
-22
-23
-24
LOG CROSS-SECTION
52000
52050
52100
52150
52200
52250
230 K
WAVENUMBER

WITH AND WITHOUT CONTINUUM

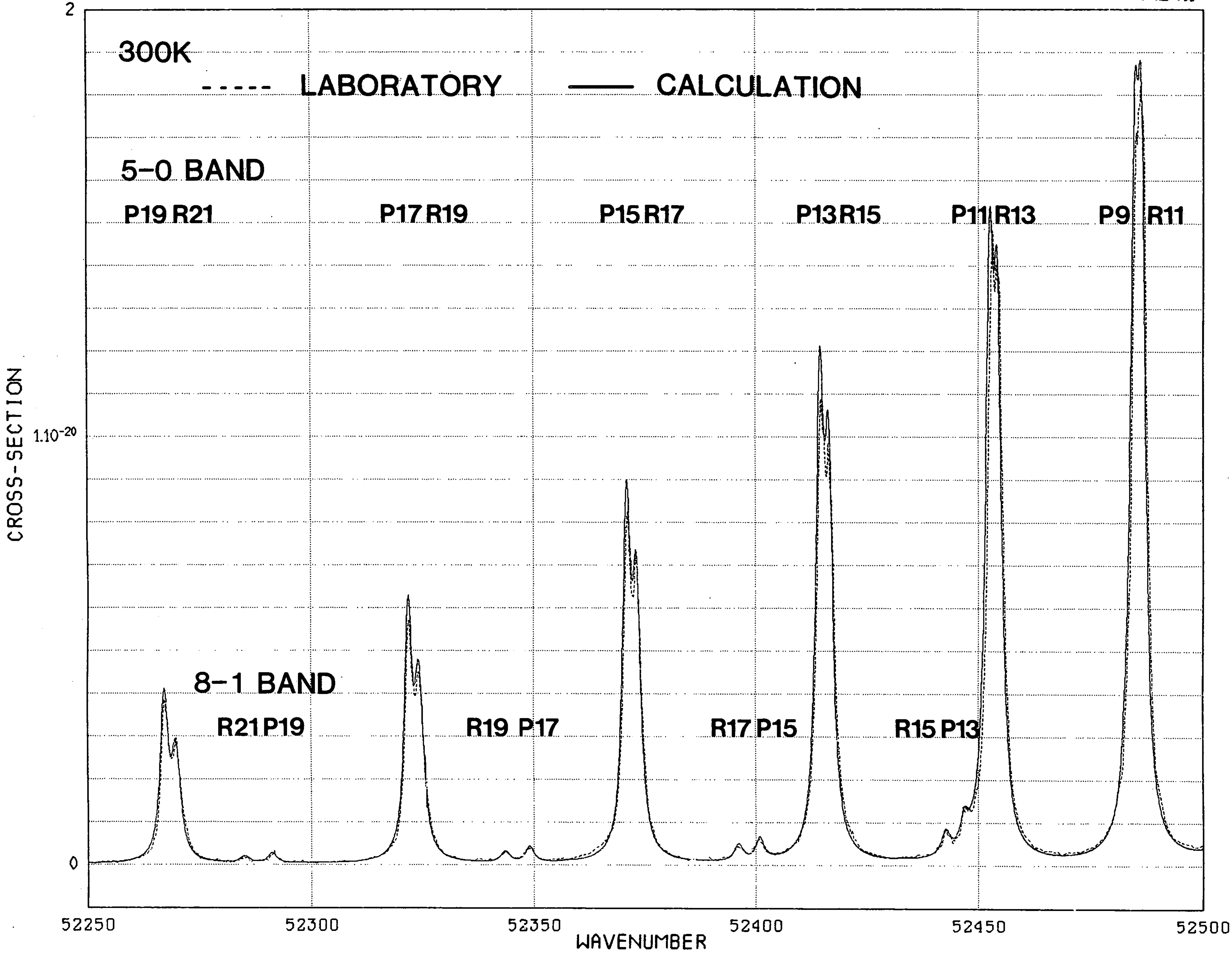


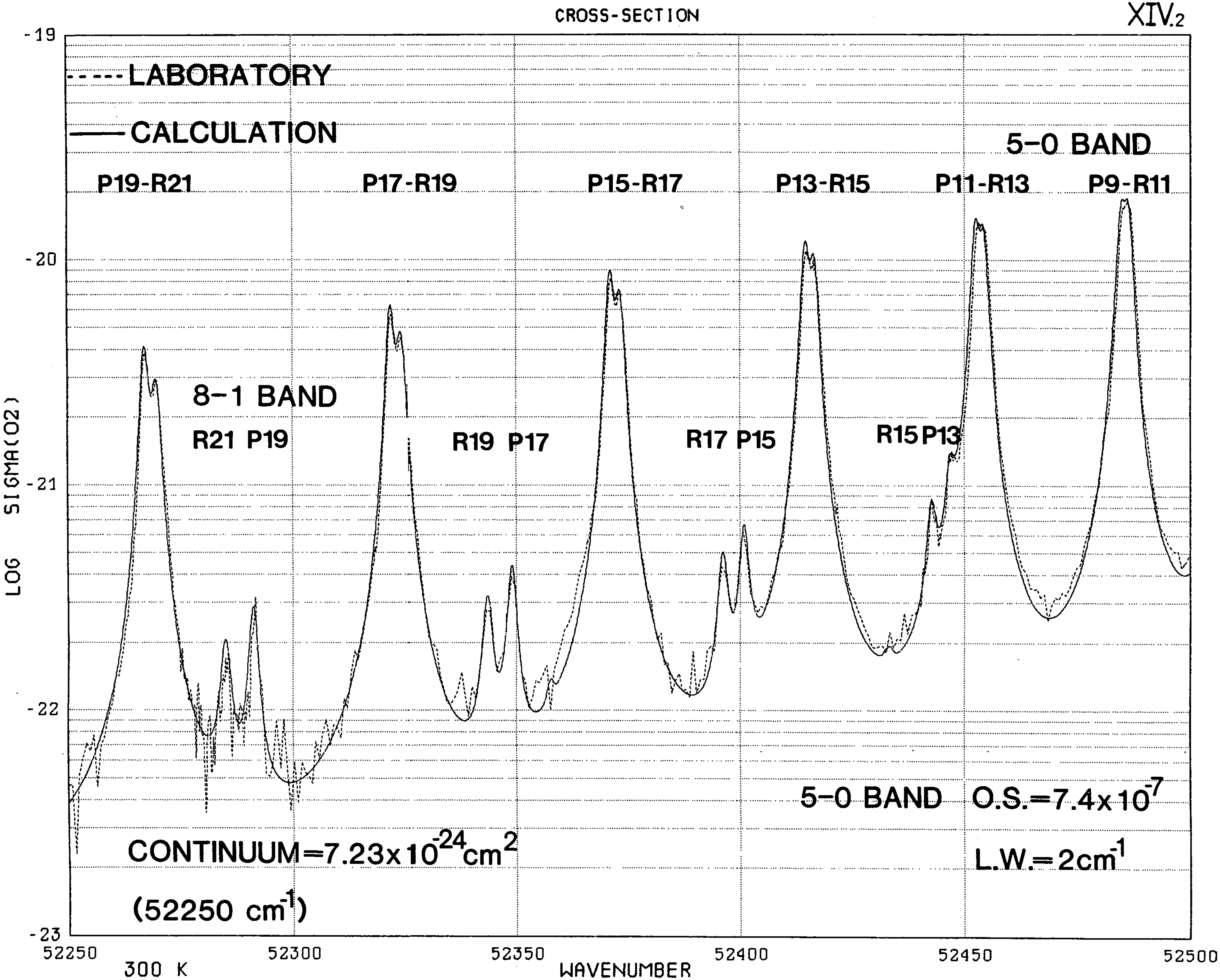

WITH AND WITHOUT CONTINUUM
-21
-22
-23
-24
LOG CROSS-SECTION
52000
52050
52100
52150
52200
52250
WAVENUMBER
190 K

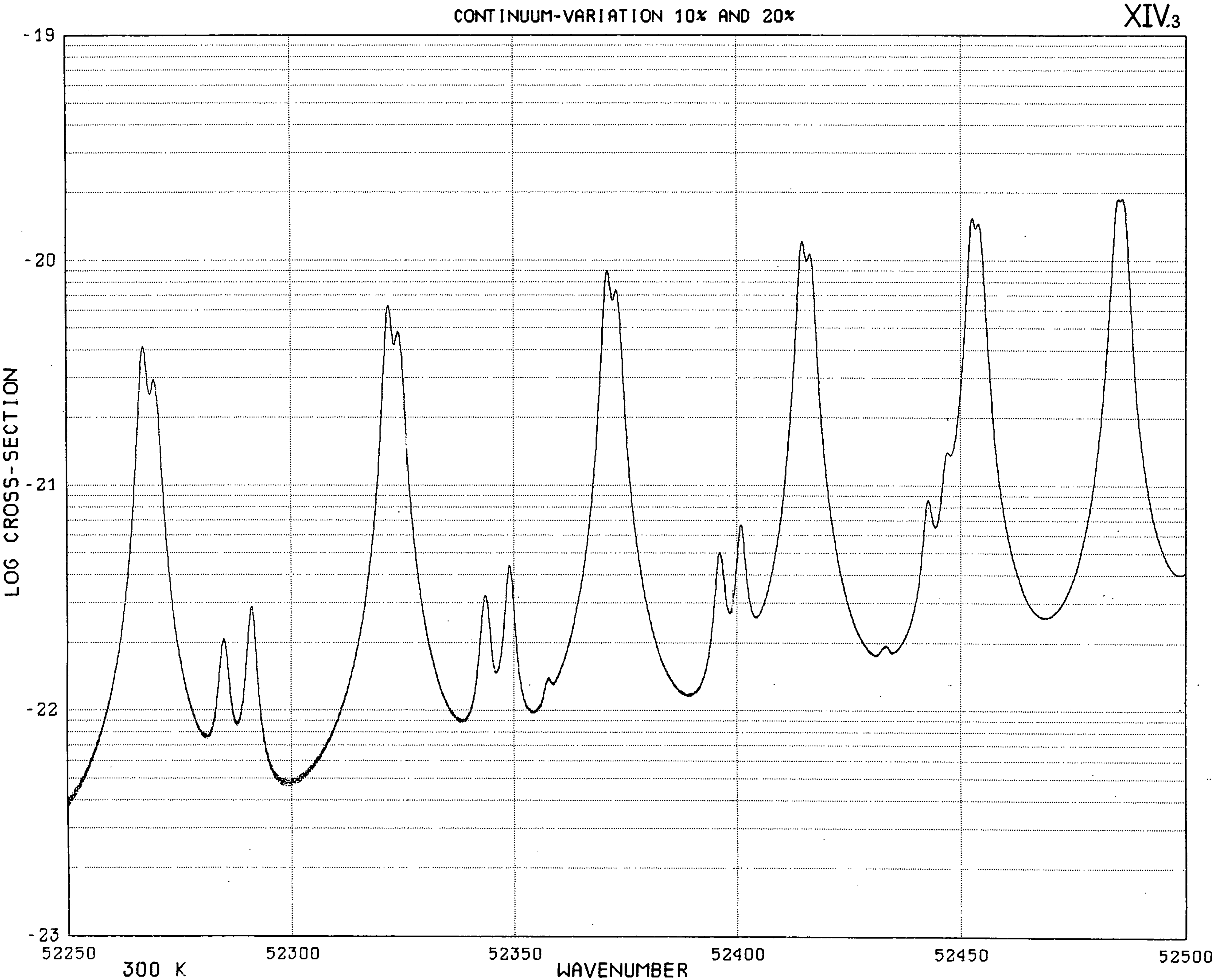
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
52250 - 52500 cm^{-1}

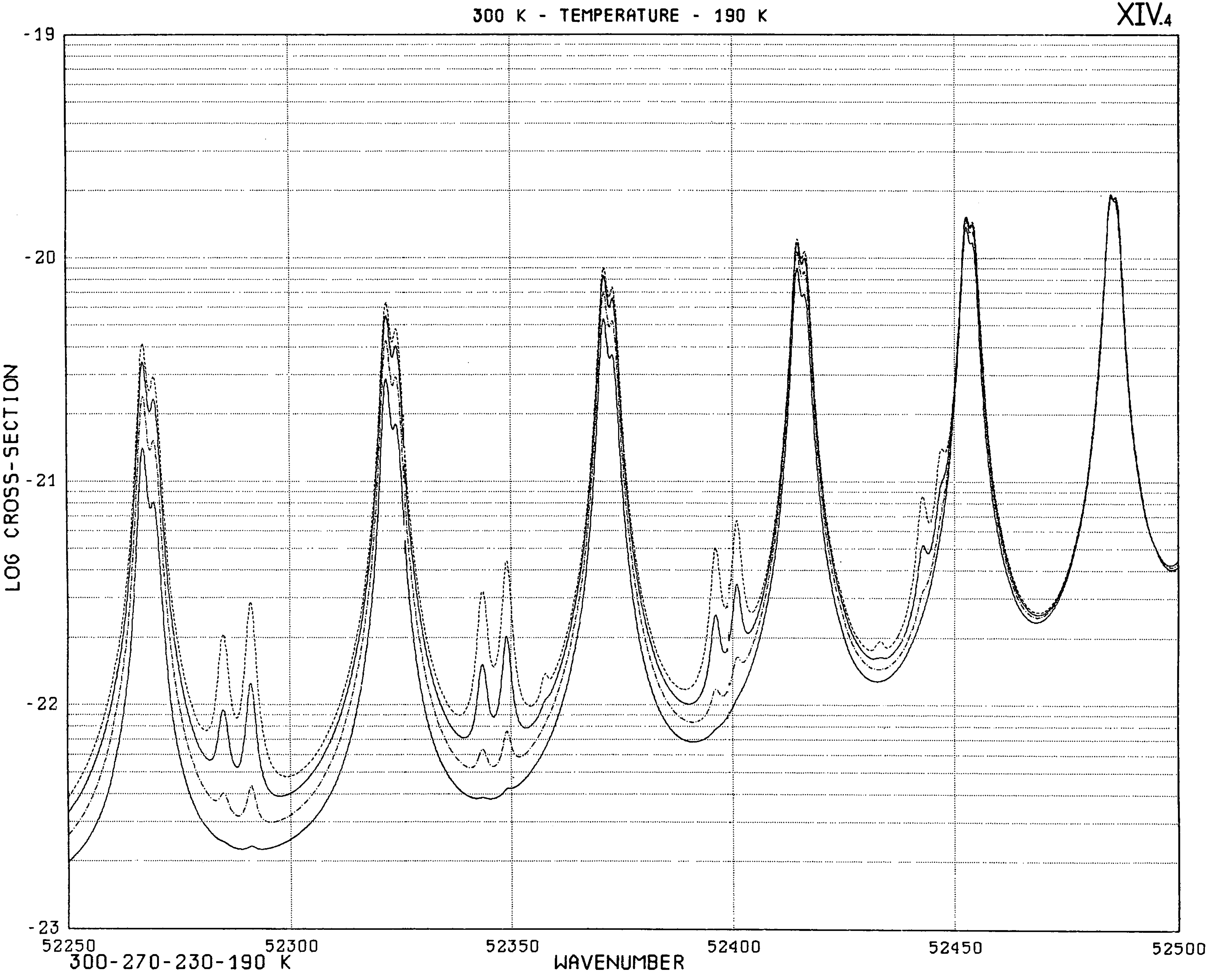
ν	λ	band	ν	λ	band
52250			52416.4	1907.80	5-0 R15
52266.9	1913.26	5-0 P19	52416.9	1907.78	5-0 R15
52267.0	1913.26	5-0 P19	52432.5	1907.21	9-1 R29
52267.4	1913.24	5-0 P19	52433.2	1907.19	9-1 R29
52269.4	1913.16	5-0 R21	52433.8	1907.17	9-1 R29
52269.6	1913.16	5-0 R21	52442.4	1906.85	8-1 R15
52270.2	1913.14	5-0 R21	52442.7	1906.84	8-1 R15
52284.5	1912.61	8-1 R21	52443.1	1906.83	8-1 R15
52284.9	1912.60	8-1 R21	52446.7	1906.70	8-1 P13
52285.5	1912.58	8-1 R21	52446.8	1906.69	8-1 P13
52290.9	1912.38	8-1 P19	52447.1	1906.68	8-1 P13
52291.1	1912.37	8-1 P19	52447.8	1906.66	9-1 P27
52291.5	1912.36	8-1 P19	52448.2	1906.64	9-1 P27
52300			52448.6	1906.63	9-1 P27
52321.7	1911.25	5-0 P17	52450		
52321.7	1911.25	5-0 P17	52452.3	1906.49	5-0 P11
52322.2	1911.24	5-0 P17	52452.4	1906.49	5-0 P11
52324.0	1911.17	5-0 R19	52452.7	1906.48	5-0 P11
52324.1	1911.16	5-0 R19	52454.1	1906.43	5-0 R13
52324.7	1911.14	5-0 R19	52454.1	1906.43	5-0 R13
52343.2	1910.47	8-1 R19	52454.6	1906.41	5-0 R13
52343.5	1910.46	8-1 R19	52455.7	1906.37	6-0 P29
52344.0	1910.44	8-1 R19	52455.9	1906.36	6-0 P29
52348.8	1910.26	8-1 P17	52456.4	1906.35	6-0 P29
52349.0	1910.26	8-1 P17	52483.0	1905.38	8-1 R13
52349.4	1910.24	8-1 P17	52483.3	1905.37	8-1 R13
52350			52483.6	1905.36	8-1 R13
52357.1	1909.96	9-1 P29	52484.7	1905.32	5-0 P 9
52357.6	1909.94	9-1 P29	52484.8	1905.32	5-0 P 9
52358.0	1909.93	9-1 P29	52485.1	1905.30	5-0 P 9
52370.8	1909.46	5-0 P15	52486.2	1905.26	5-0 R11
52370.9	1909.46	5-0 P15	52486.2	1905.26	5-0 R11
52371.3	1909.44	5-0 P15	52486.6	1905.25	8-1 P11
52373.0	1909.38	5-0 R17	52486.6	1905.25	5-0 R11
52373.1	1909.38	5-0 R17	52486.8	1905.24	8-1 P11
52373.6	1909.36	5-0 R17	52487.1	1905.23	8-1 P11
52395.8	1908.55	8-1 R17			
52396.1	1908.54	8-1 R17			
52396.5	1908.52	8-1 R17			
52400					
52400.7	1908.37	8-1 P15			
52400.9	1908.37	8-1 P15			
52401.2	1908.35	8-1 P15			
52414.4	1907.87	5-0 P13			
52414.4	1907.87	5-0 P13			
52414.8	1907.86	5-0 P13			
52416.3	1907.80	5-0 R15			

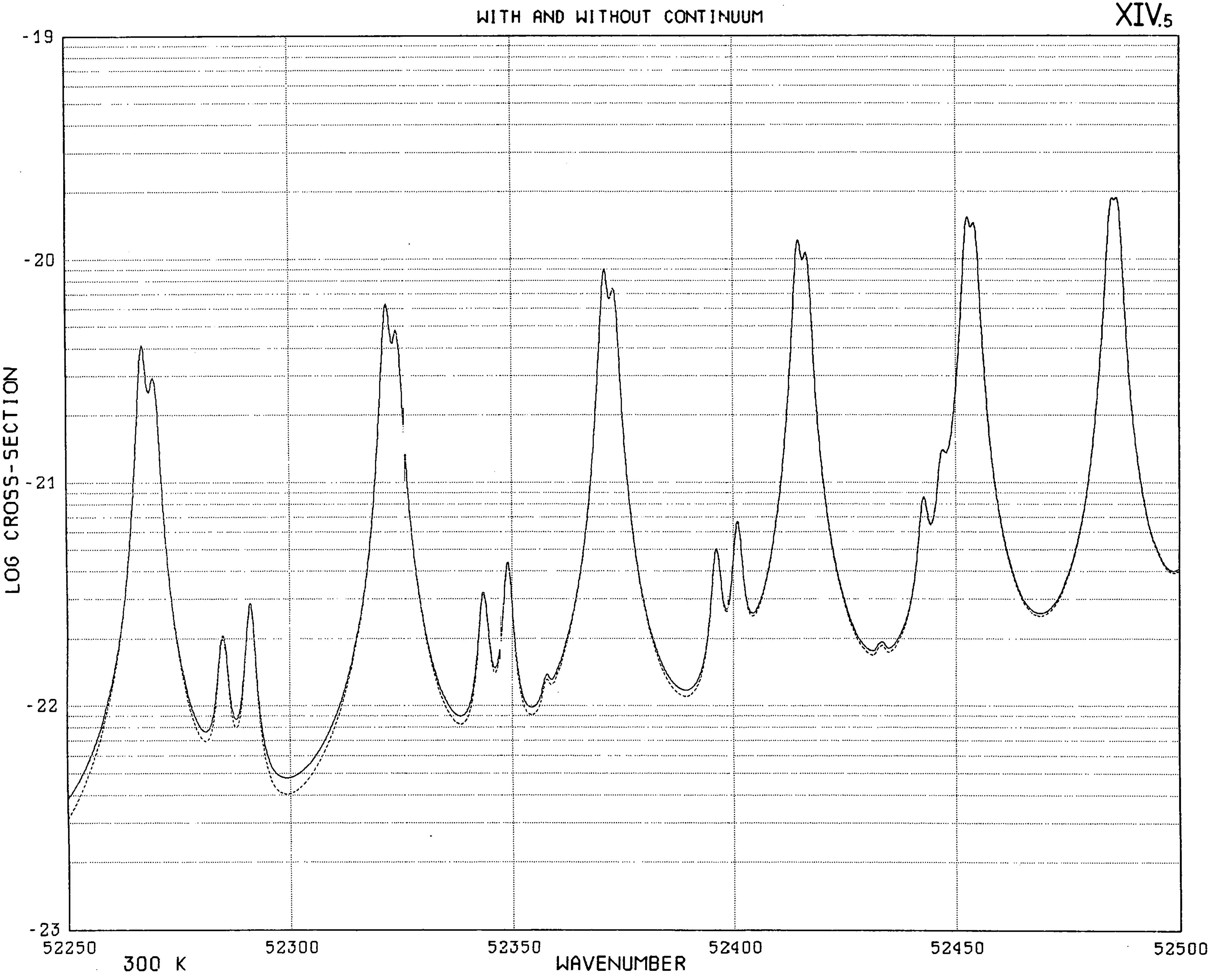
IDENTIFICATION

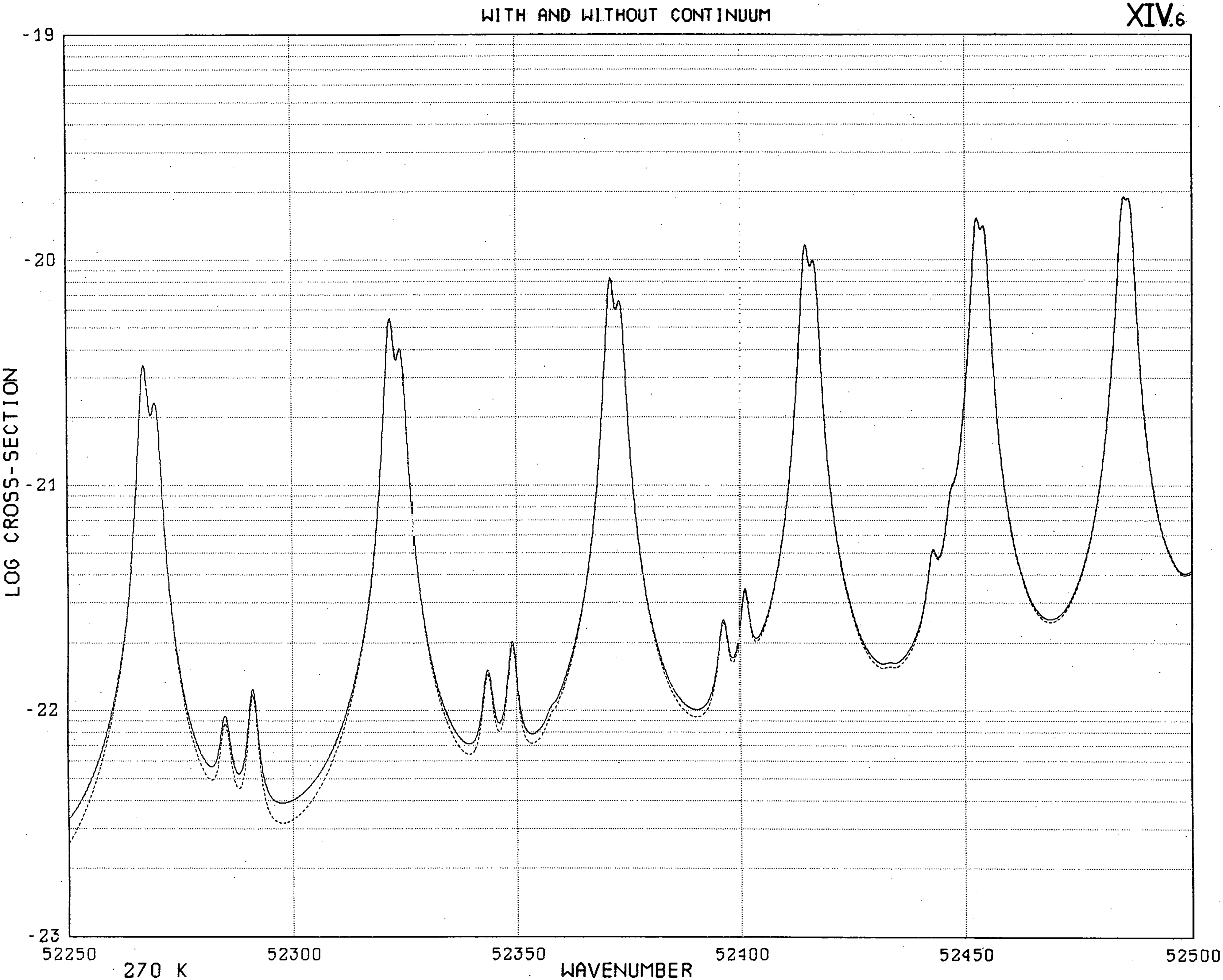


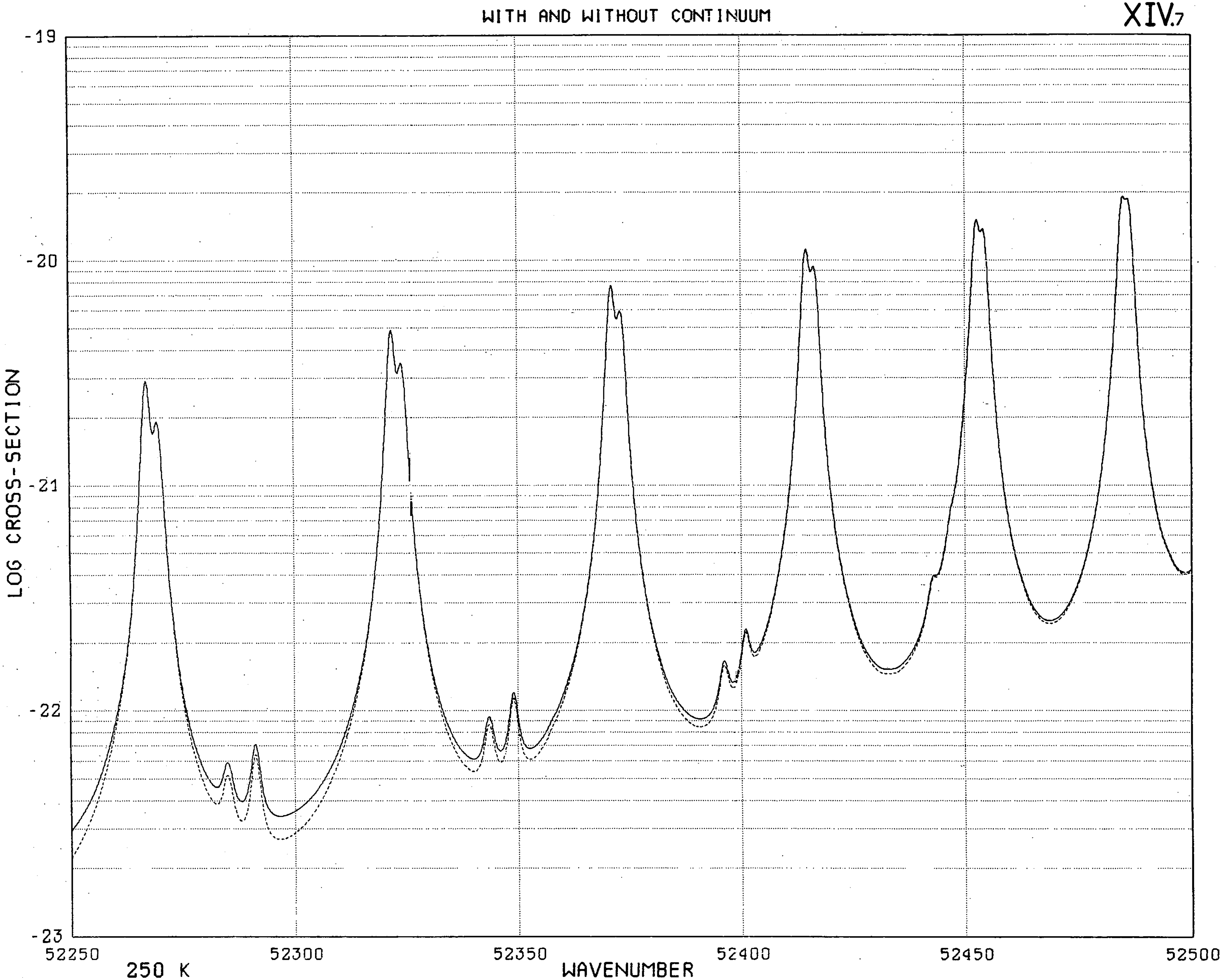

CROSS-SECTION
LABORATORY
CALCULATION
5-0 BAND
P19-R21
P17-R19
P15-R17
P13-R15
P11-R13
P9-R11
8-1 BAND
R21 P19
R19 P17
R17 P15
R15 P13
5-0 BAND O.S.=7.4x10^{-7}
L.W.=2cm^{-1}
CONTINUUM=7.23x10^{-24}cm^2
(52250 cm^{-1})
LOG SIGMA(O2)
-19
-20
-21
-22
-23
52250
52300
52350
52400
52450
52500
300 K
WAVENUMBER

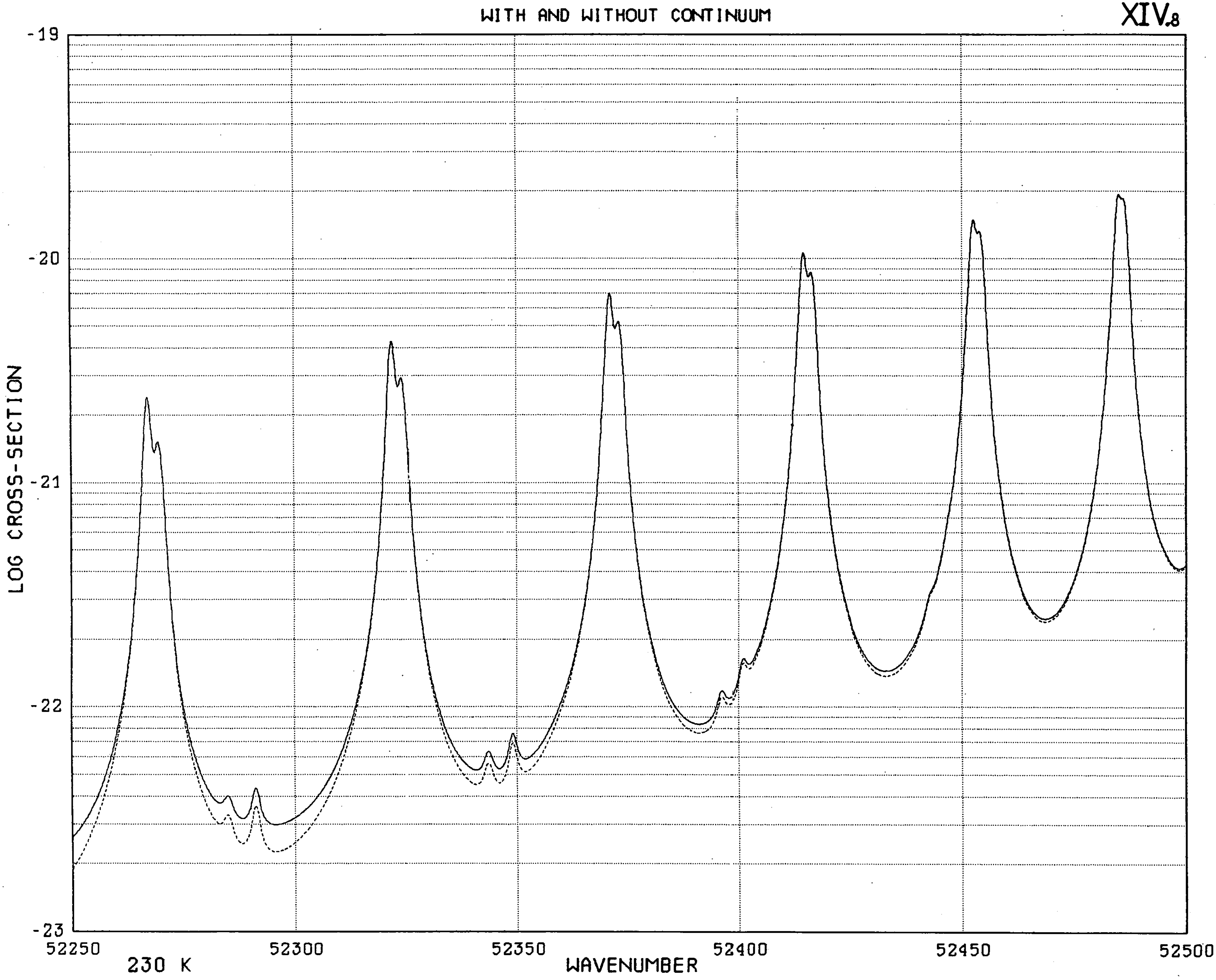

CONTINUUM-VARIATION 10% AND 20%
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52250
52300
52350
52400
52450
52500
300 K
WAVENUMBER

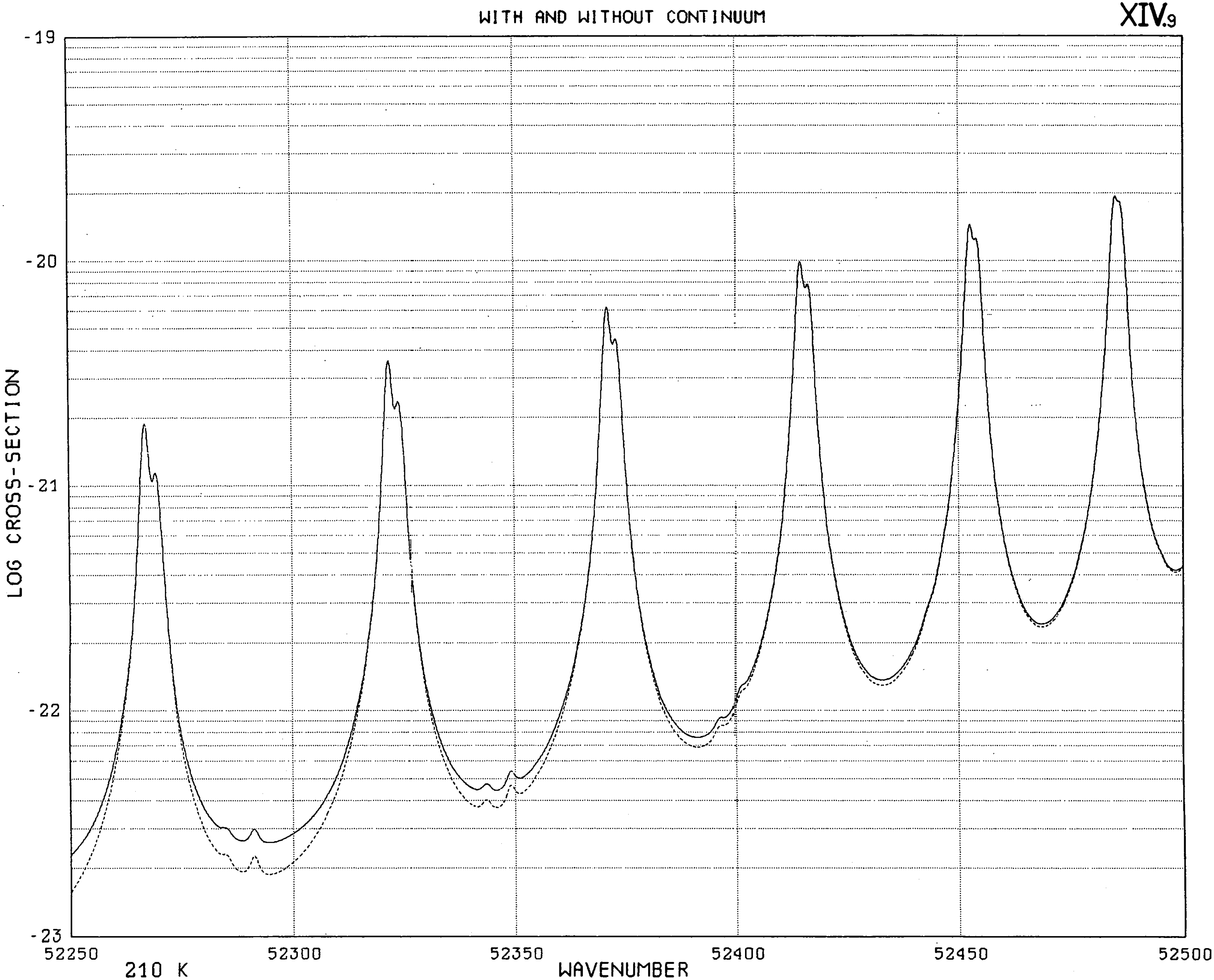

300 K - TEMPERATURE - 190 K
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52250
52300
52350
52400
52450
52500
WAVENUMBER
300-270-230-190 K

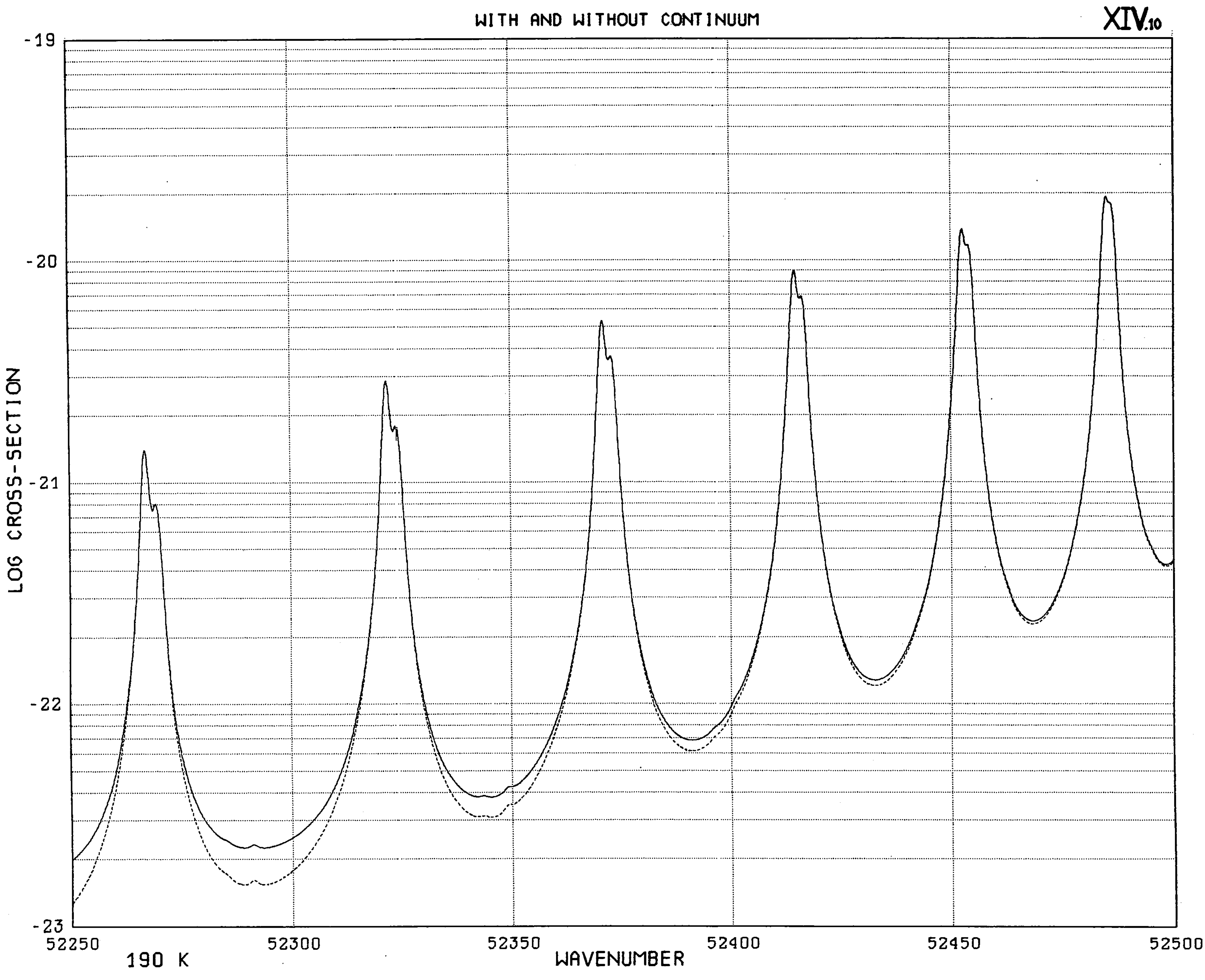

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
52250
52300
52350
52400
52450
52500
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52250
52300
52350
52400
52450
52500
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
52250
52300
52350
52400
52450
52500
WAVENUMBER
250 K


WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52250
52300
52350
52400
52450
52500
230 K
WAVENUMBER

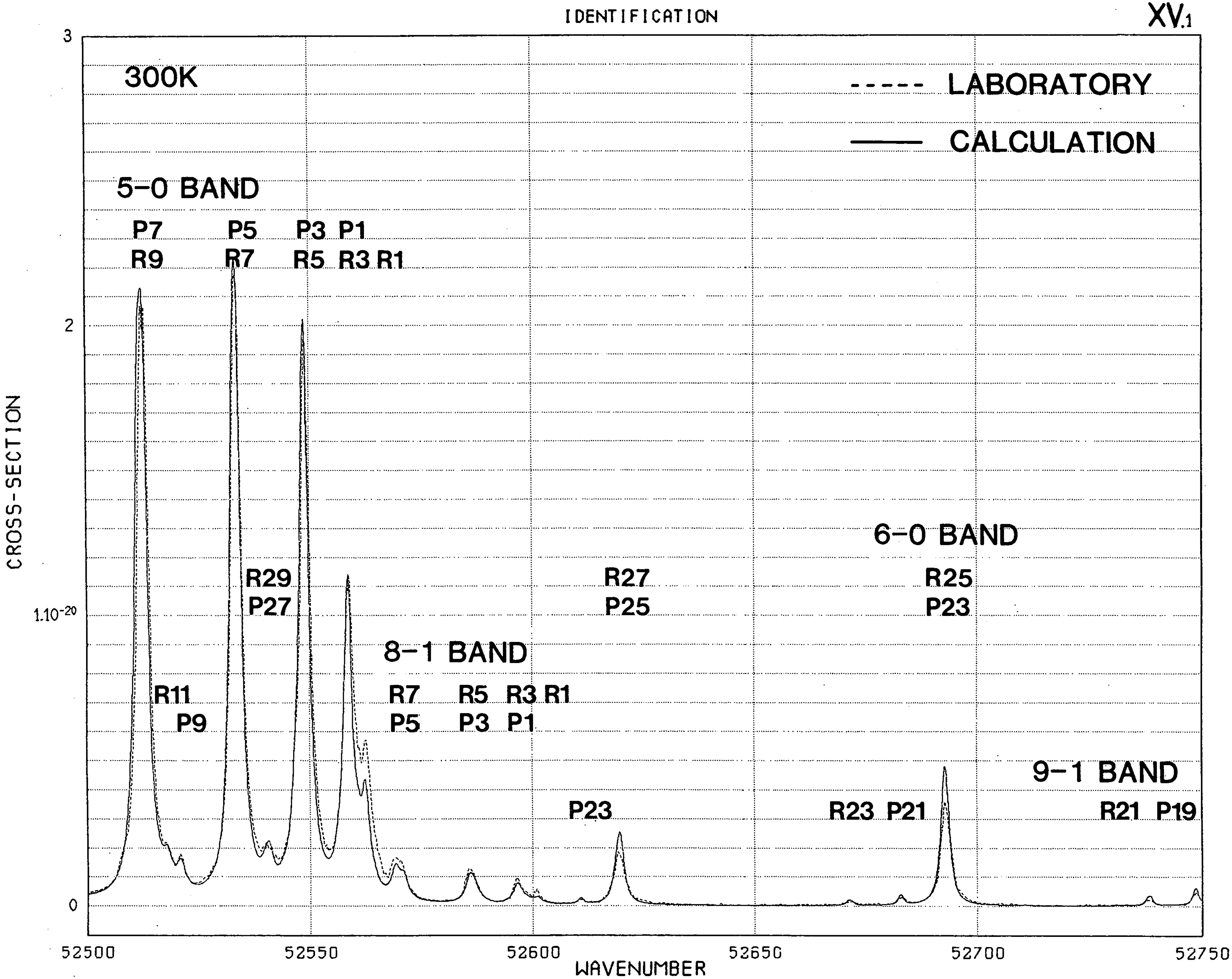

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52250
52300
52350
52400
52450
52500
210 K
WAVENUMBER

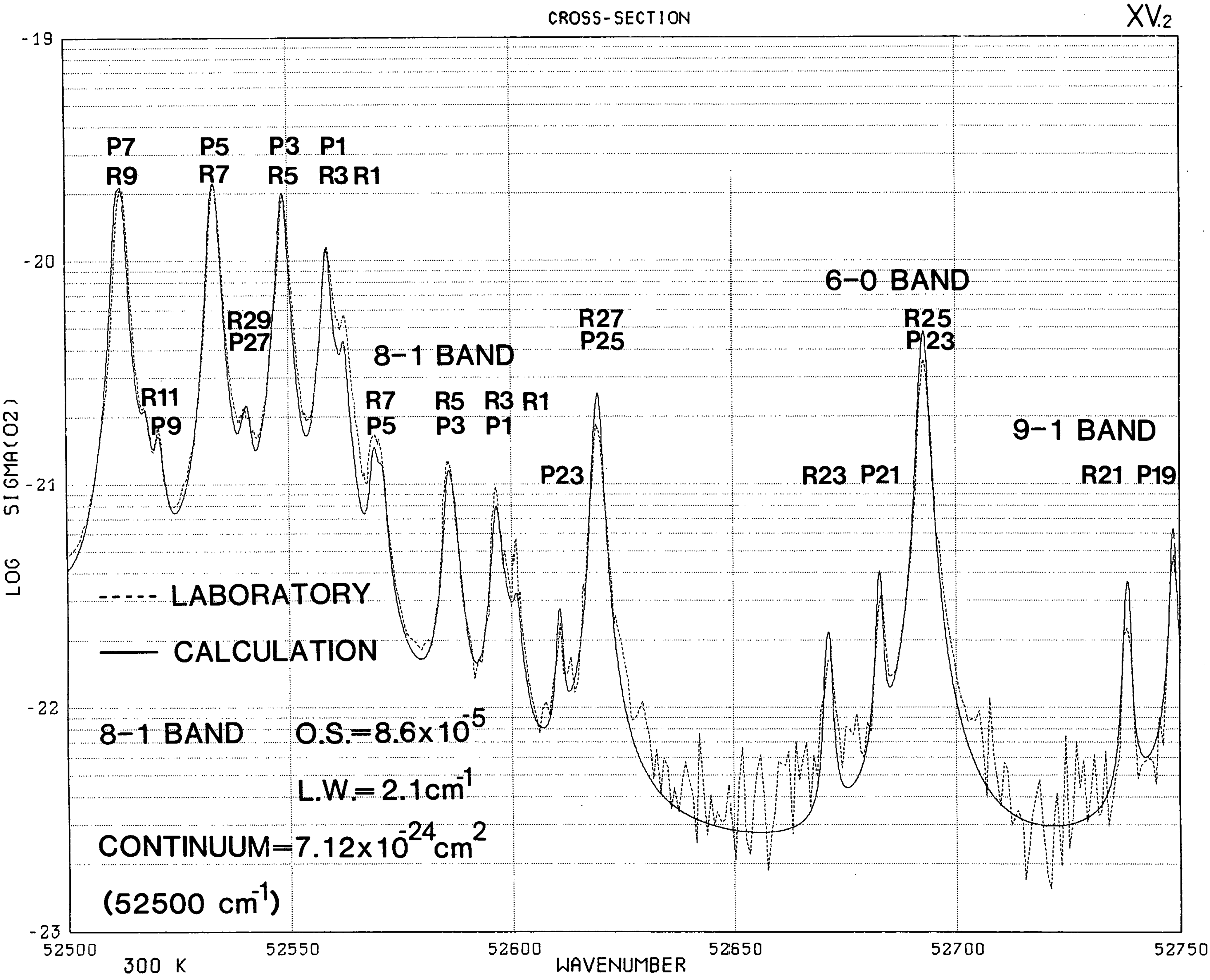


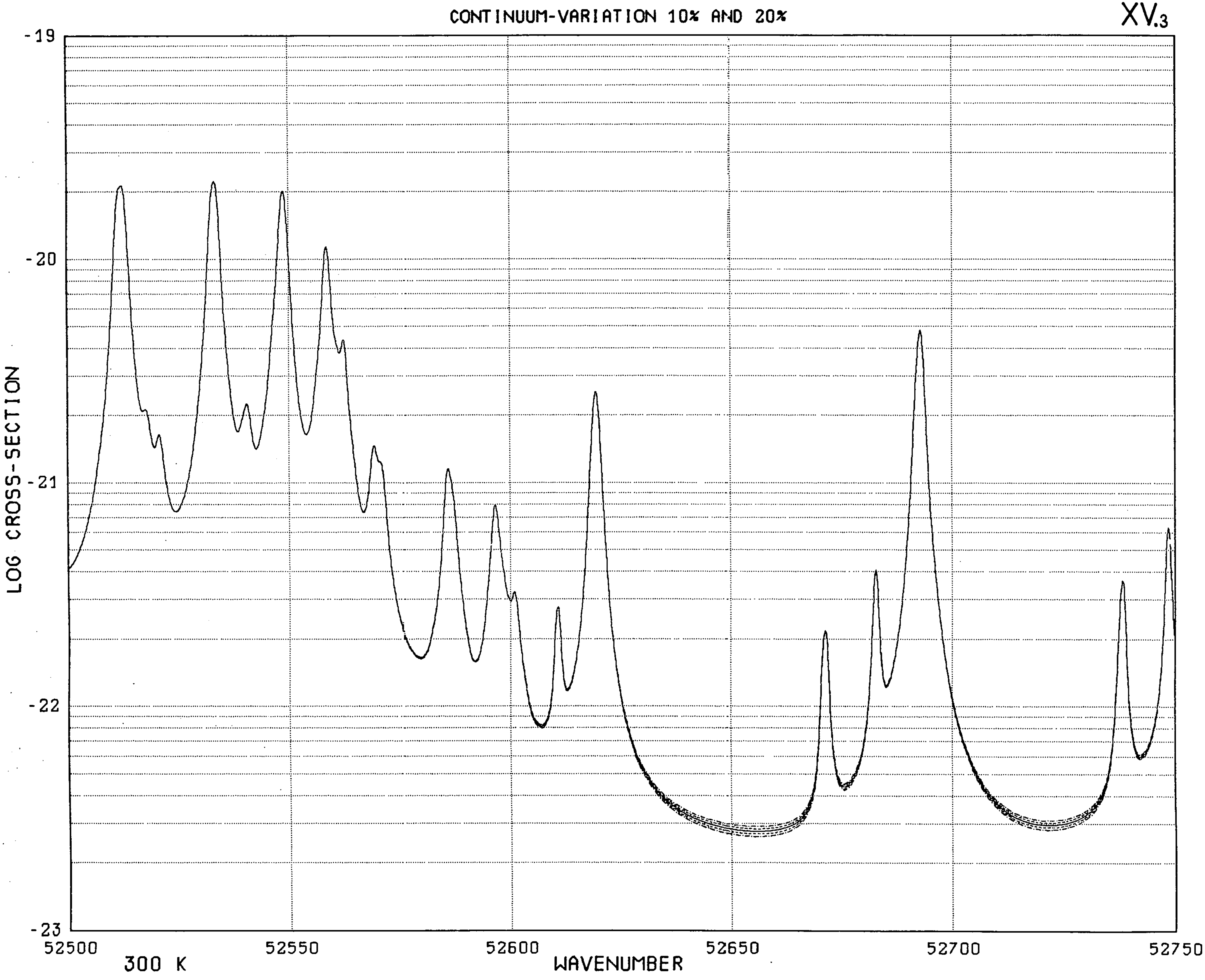
WITH AND WITHOUT CONTINUUM
XIV.10
LOG CROSS-SECTION
-19
-20
-21
-22
-23
52250
52300
52350
52400
52450
52500
WAVENUMBER
190 K

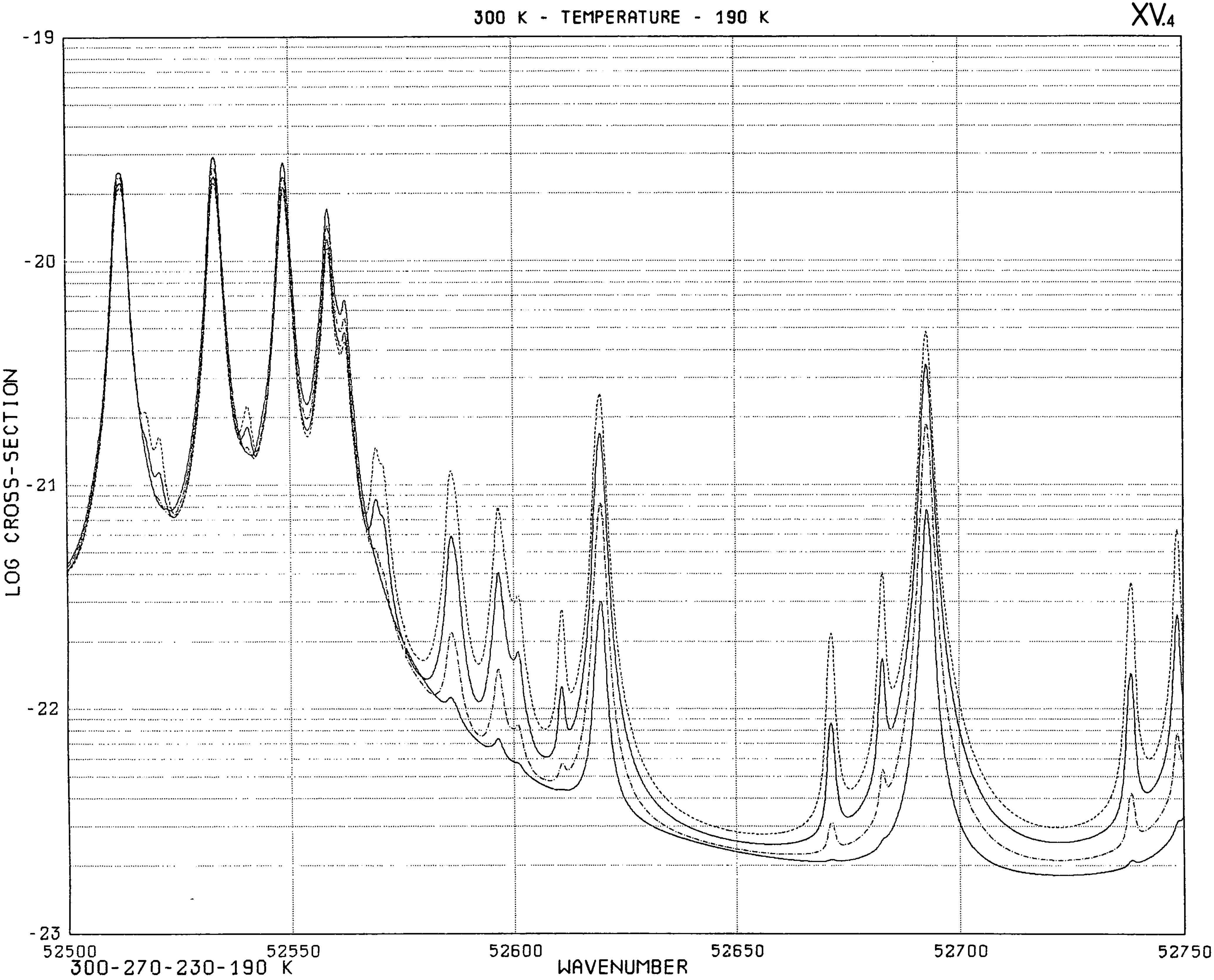
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
52500 - 52750 cm^{-1}

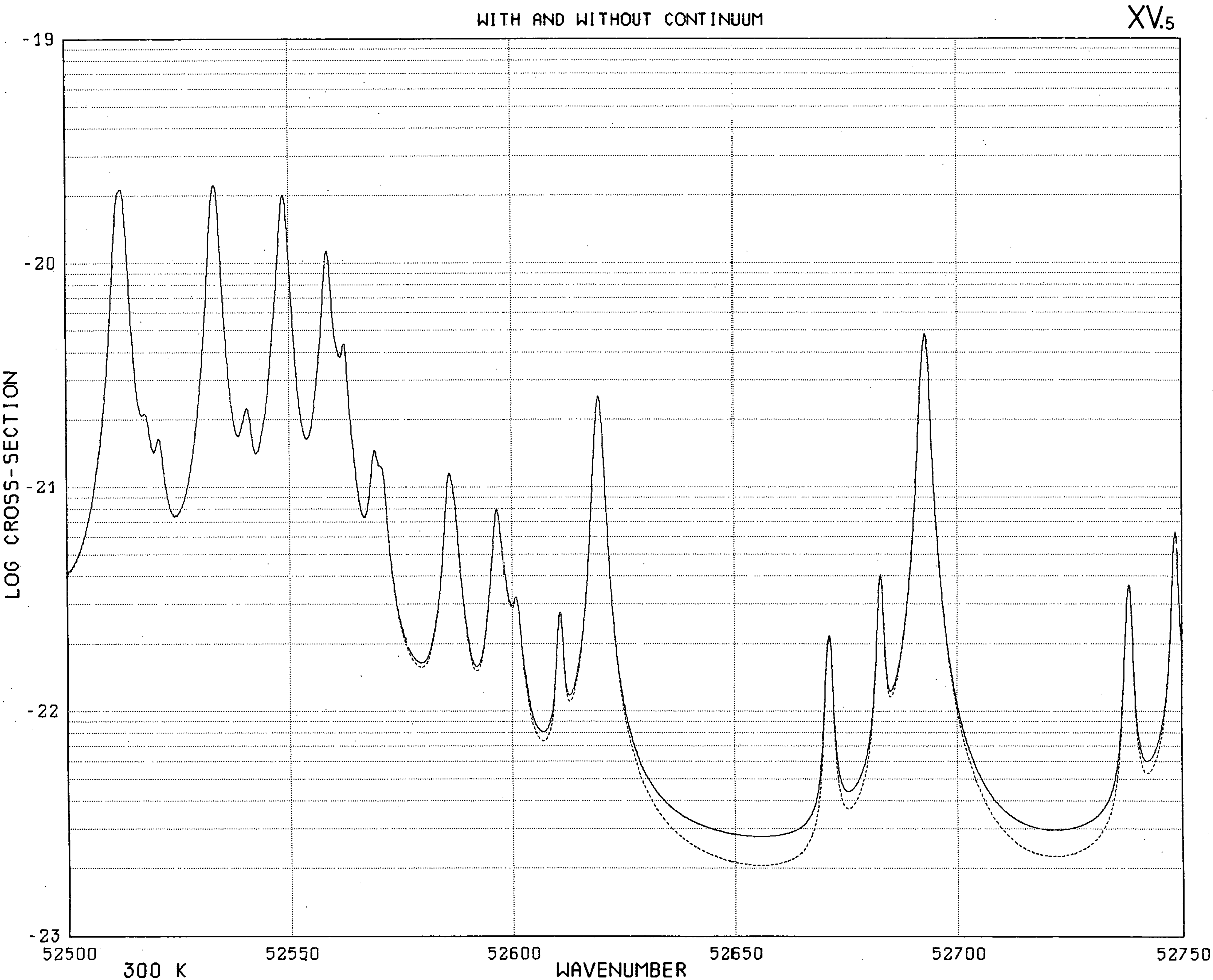
ν	λ	band	ν	λ	band	ν	λ	band
52500								
52511.4	1904.35	5-0 P 7	52562.5	1902.50	5-0 R 1	52693.4	1897.77	6-0 P23
52511.5	1904.34	5-0 P 7	52562.5	1902.50	5-0 R 1	52700		
52511.8	1904.33	5-0 P 7	52569.0	1902.26	8-1 R 7	52737.9	1896.17	9-1 R21
52512.7	1904.30	5-0 R 9	52569.1	1902.26	8-1 R 7	52738.4	1896.15	9-1 R21
52512.7	1904.30	5-0 R 9	52569.4	1902.25	8-1 R 7	52738.7	1896.14	9-1 R21
52513.1	1904.29	5-0 R 9	52570.8	1902.20	8-1 P 5	52748.3	1895.79	9-1 P19
52517.6	1904.12	8-1 R11	52570.9	1902.19	8-1 P 5	52748.7	1895.78	9-1 P19
52517.8	1904.12	8-1 R11	52571.2	1902.18	8-1 P 5	52748.9	1895.77	9-1 P19
52518.2	1904.10	8-1 R11	52585.6	1901.66	8-1 R 5			
52518.2	1904.10	9-1 R27	52585.8	1901.65	8-1 R 5			
52518.8	1904.08	9-1 R27	52586.1	1901.64	8-1 R 5			
52519.4	1904.06	9-1 R27	52586.9	1901.62	8-1 P 3			
52520.7	1904.01	8-1 P 9	52587.0	1901.61	8-1 P 3			
52520.8	1904.01	8-1 P 9	52587.5	1901.59	8-1 P 3			
52521.0	1904.00	8-1 P 9	52596.3	1901.27	8-1 R 3			
52532.2	1903.60	9-1 P25	52596.5	1901.27	8-1 R 3			
52532.6	1903.58	5-0 P 5	52596.9	1901.25	8-1 R 3			
52532.7	1903.58	5-0 P 5	52596.9	1901.25	8-1 P 1			
52533.0	1903.57	9-1 P25	52597.6	1901.23	9-1 R25			
52533.5	1903.55	5-0 R 7	52598.2	1901.20	9-1 R25			
52533.6	1903.54	5-0 R 7	52598.7	1901.19	9-1 R25			
52534.0	1903.53	5-0 R 7	52599.6	1901.15	8-1 Q 1			
52539.4	1903.34	6-0 R29	52600					
52539.6	1903.32	6-0 R29	52601.0	1901.10	8-1 R 1			
52540.3	1903.30	6-0 R29	52601.2	1901.10	8-1 R 1			
52540.5	1903.29	6-0 P27	52610.4	1900.76	9-1 P23			
52540.6	1903.29	6-0 P27	52610.8	1900.75	9-1 P23			
52541.1	1903.27	6-0 P27	52611.1	1900.74	9-1 P23			
52546.3	1903.08	8-1 R 9	52618.6	1900.47	6-0 R27			
52546.5	1903.08	8-1 R 9	52618.9	1900.46	6-0 R27			
52546.8	1903.07	8-1 R 9	52619.5	1900.44	6-0 R27			
52548.1	1903.02	5-0 P 3	52619.6	1900.43	6-0 P25			
52548.2	1903.01	5-0 P 3	52619.6	1900.43	6-0 P25			
52548.6	1903.00	5-0 P 3	52620.1	1900.41	6-0 P25			
52548.7	1903.00	8-1 P 7	52650					
52548.8	1902.99	5-0 R 5	52670.9	1898.58	9-1 R23			
52548.8	1902.99	8-1 P 7	52671.4	1898.56	9-1 R23			
52548.9	1902.99	5-0 R 5	52671.8	1898.55	9-1 R23			
52549.1	1902.98	8-1 P 7	52682.5	1898.16	9-1 P21			
52549.2	1902.98	5-0 R 5	52682.9	1898.15	9-1 P21			
52550			52683.1	1898.14	9-1 P21			
52558.1	1902.66	5-0 P 1	52692.1	1897.82	6-0 R25			
52558.4	1902.64	5-0 R 3	52692.3	1897.81	6-0 R25			
52558.5	1902.64	5-0 R 3	52692.9	1897.79	6-0 P23			
52558.9	1902.63	5-0 R 3	52692.9	1897.79	6-0 R25			
52560.9	1902.56	5-0 Q 1	52692.9	1897.79	6-0 P23			

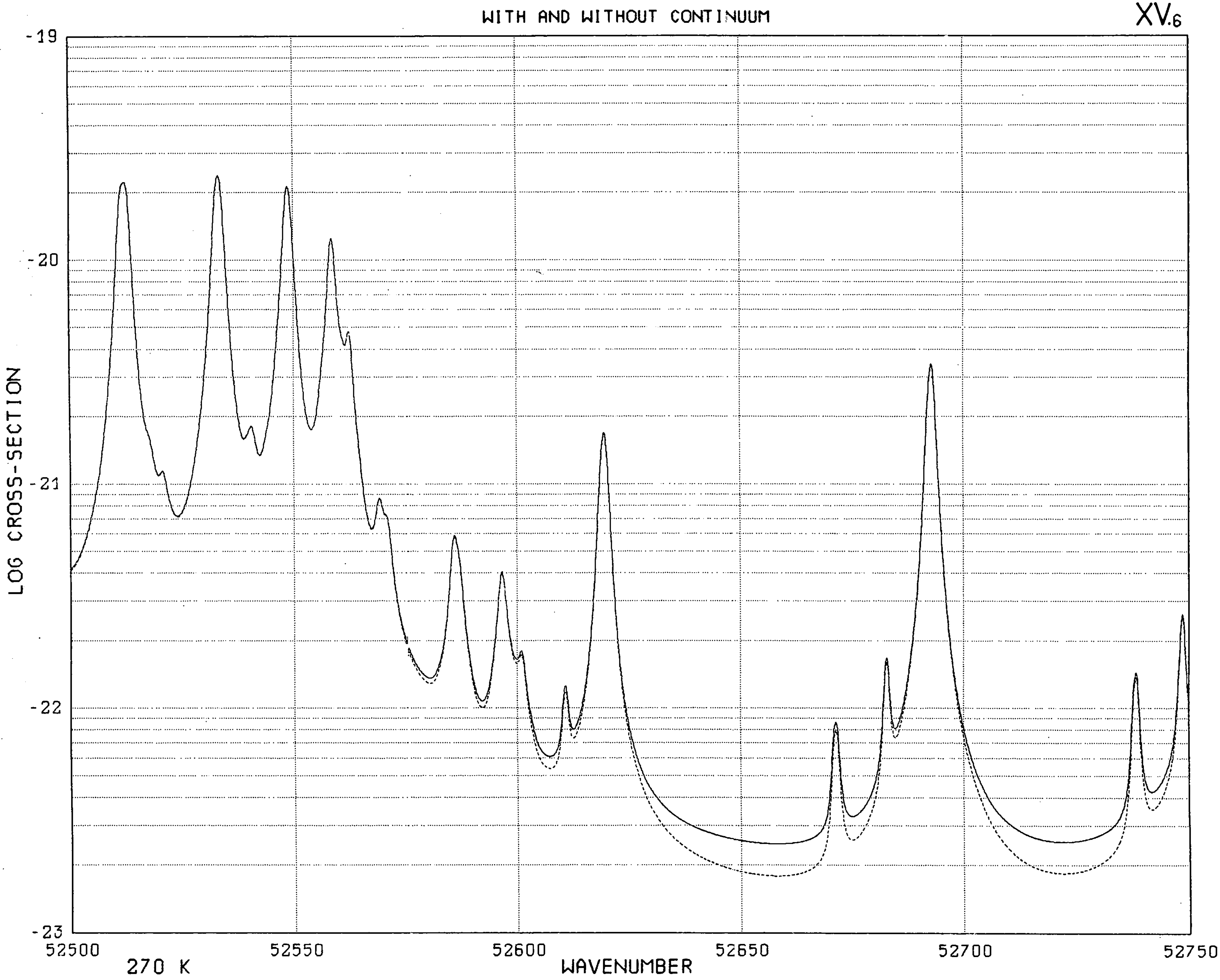

IDENTIFICATION
300K
LABORATORY
CALCULATION
5-0 BAND
P7 R9
P5 R7
P3 P1 R5 R3 R1
R29 P27
R11 P9
8-1 BAND
R7 P5
R5 P3
R3 R1 P1
R27 P25
P23
6-0 BAND
R25 P23
R23 P21
9-1 BAND
R21 P19
CROSS-SECTION
3
2
1.10-20
0
52500
52550
52600
52650
52700
52750
WAVENUMBER

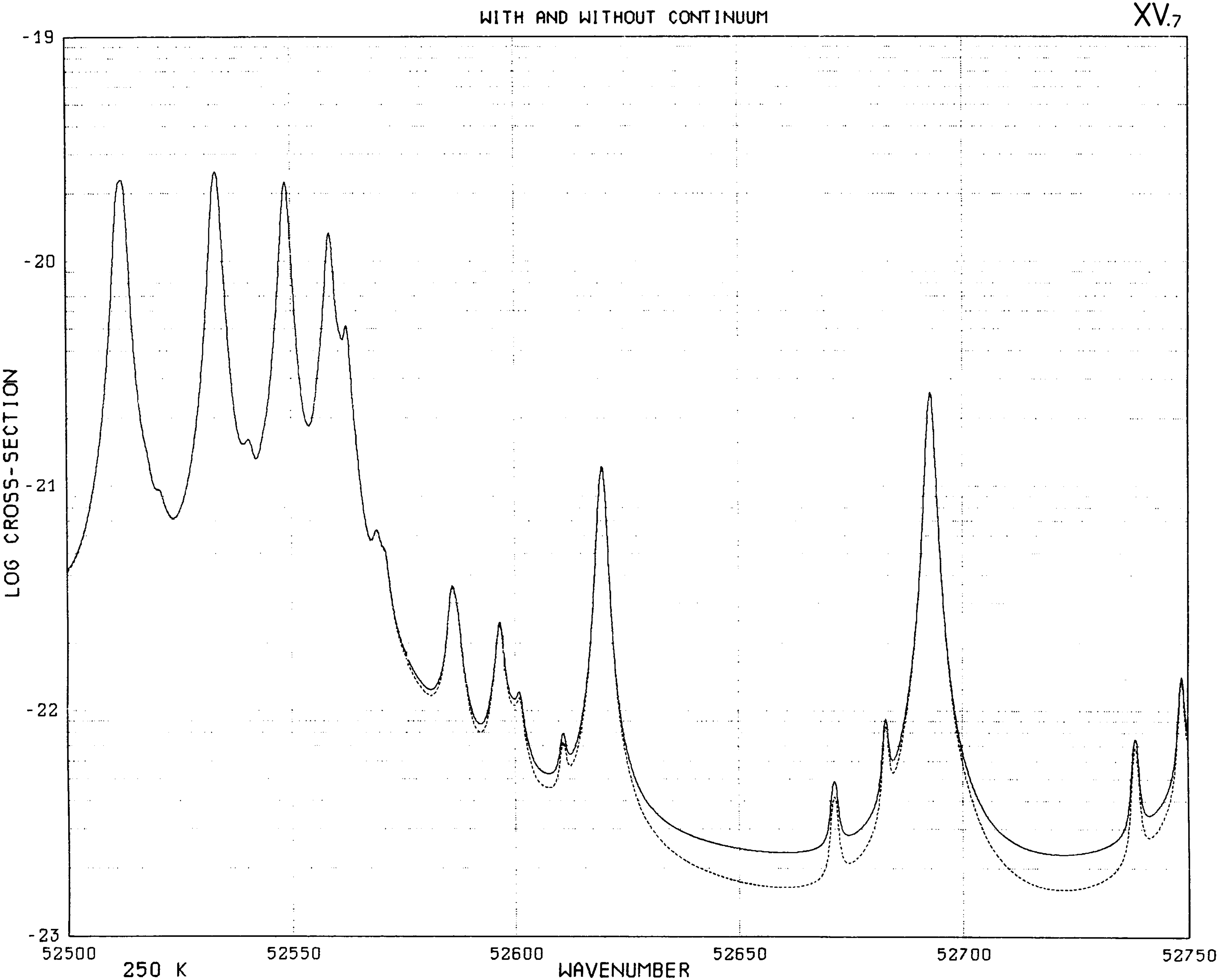

CROSS-SECTION
XV.2
-19
-20
-21
-22
-23
LOG SIGMA(O2)
P7
R9
P5
R7
P3
R5
P1
R3 R1
R29
P27
8-1 BAND
R27
P25
6-0 BAND
R25
P23
R11
P9
R7
P5
R5
P3
R3 R1
P1
P23
R23 P21
9-1 BAND
R21 P19
----- LABORATORY
—— CALCULATION
8-1 BAND O.S.=8.6x10^-5
L.W.=2.1cm^-1
CONTINUUM=7.12x10^-24 cm^2
(52500 cm^-1)
52500
52550
52600
52650
52700
52750
300 K
WAVENUMBER

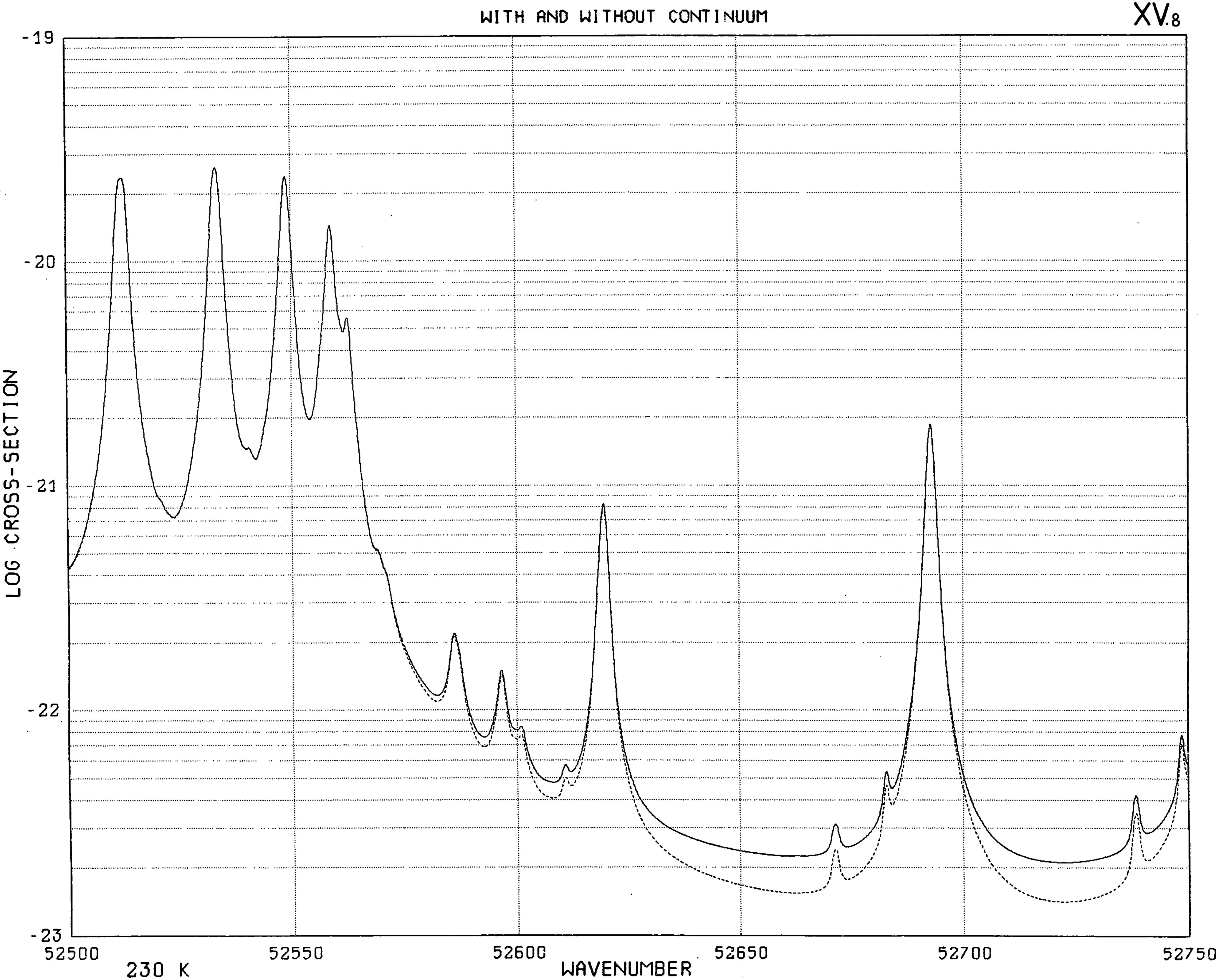

CONTINUUM-VARIATION 10% AND 20%
LOG CROSS-SECTION
-19
-20
-21
-22
-23
52500
52550
52600
52650
52700
52750
300 K
WAVENUMBER

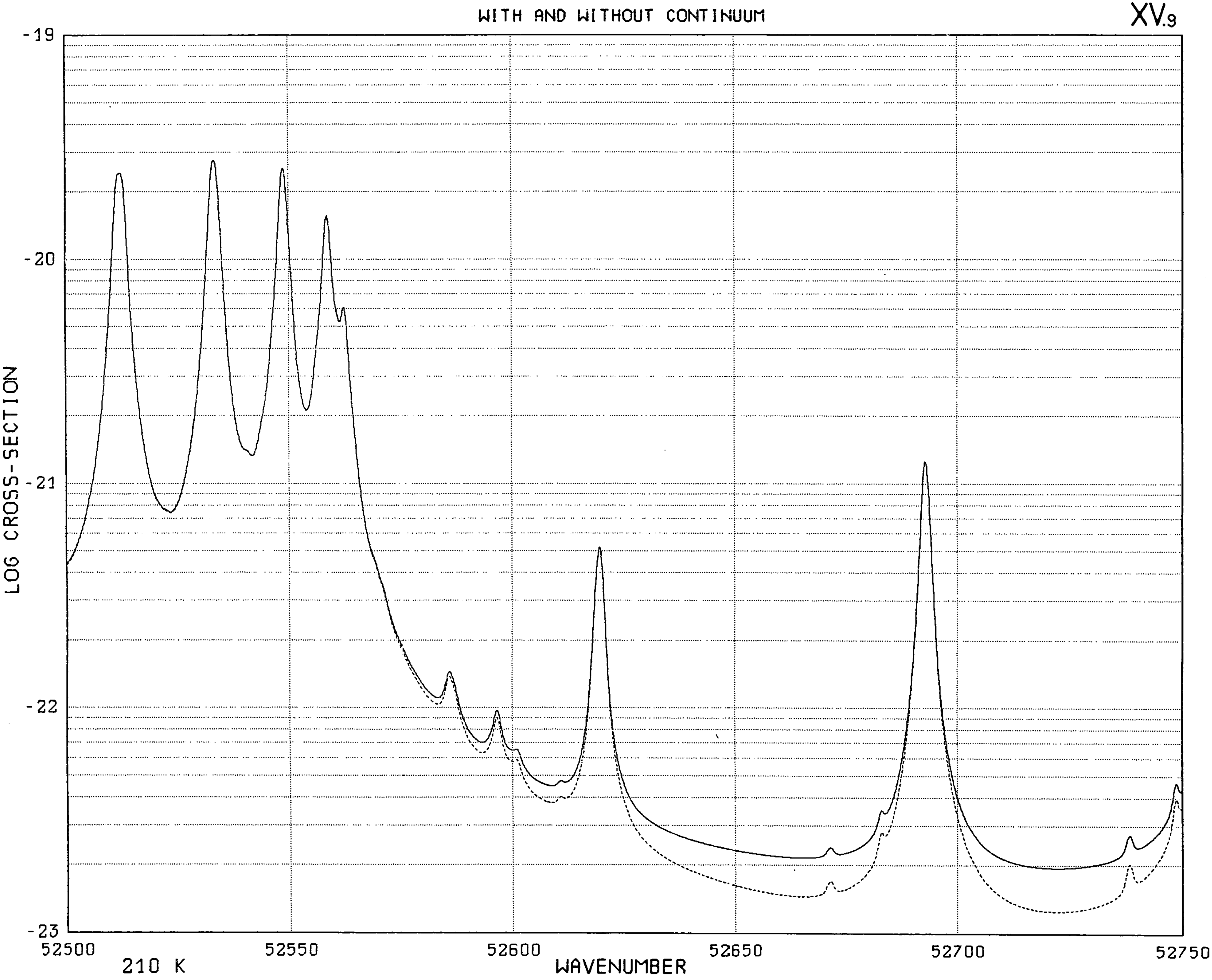

300 K - TEMPERATURE - 190 K
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52500
52550
52600
52650
52700
52750
WAVENUMBER
300-270-230-190 K


WITH AND WITHOUT CONTINUUM
XV.5
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52500
52550
52600
52650
52700
52750
300 K
WAVENUMBER

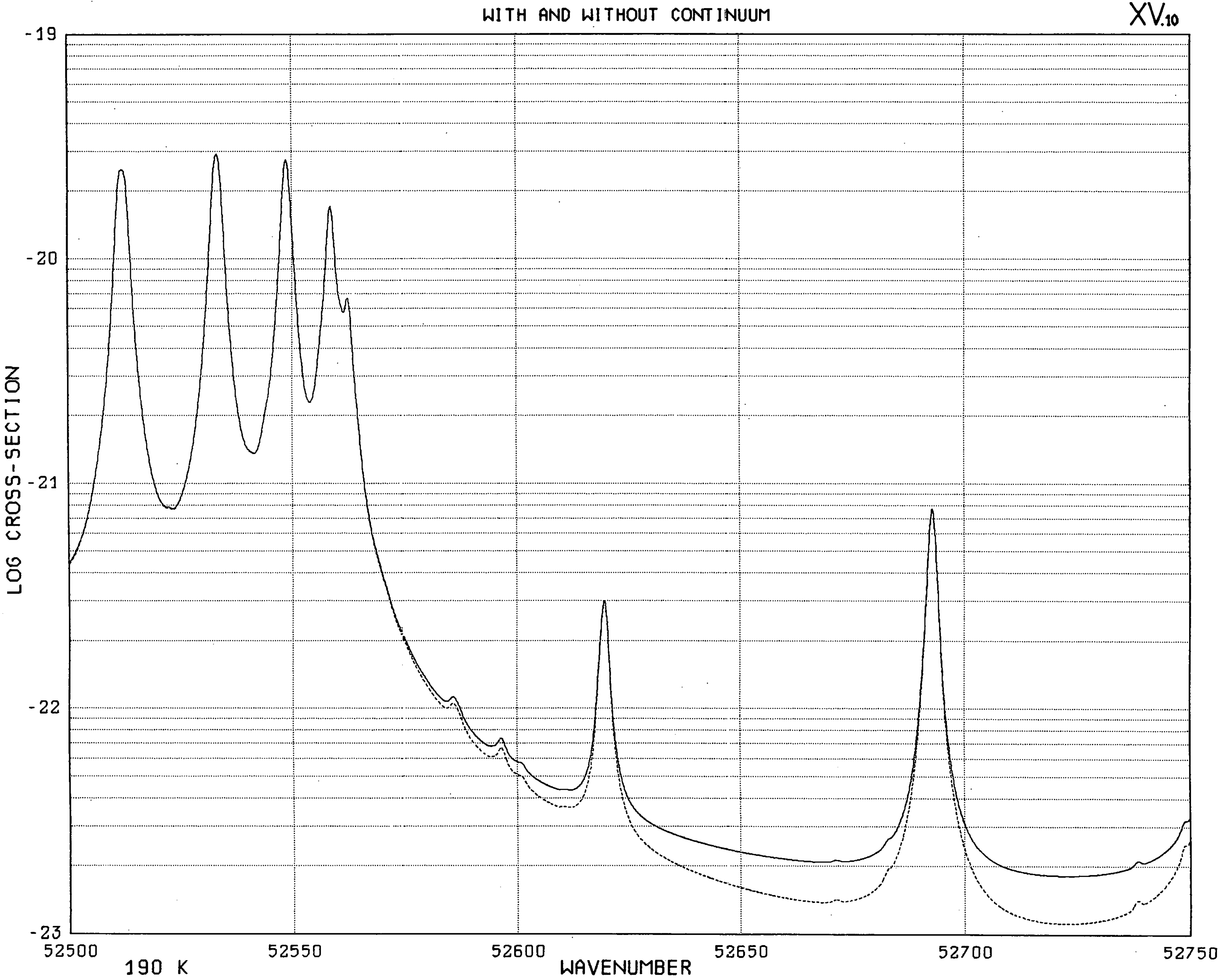

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52500
52550
52600
52650
52700
52750
WAVENUMBER
270 K


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
52500
52550
52600
52650
52700
52750
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
52500
52550
52600
52650
52700
52750
WAVENUMBER
230 K


XV.9
WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52500
52550
52600
52650
52700
52750
210 K
WAVENUMBER

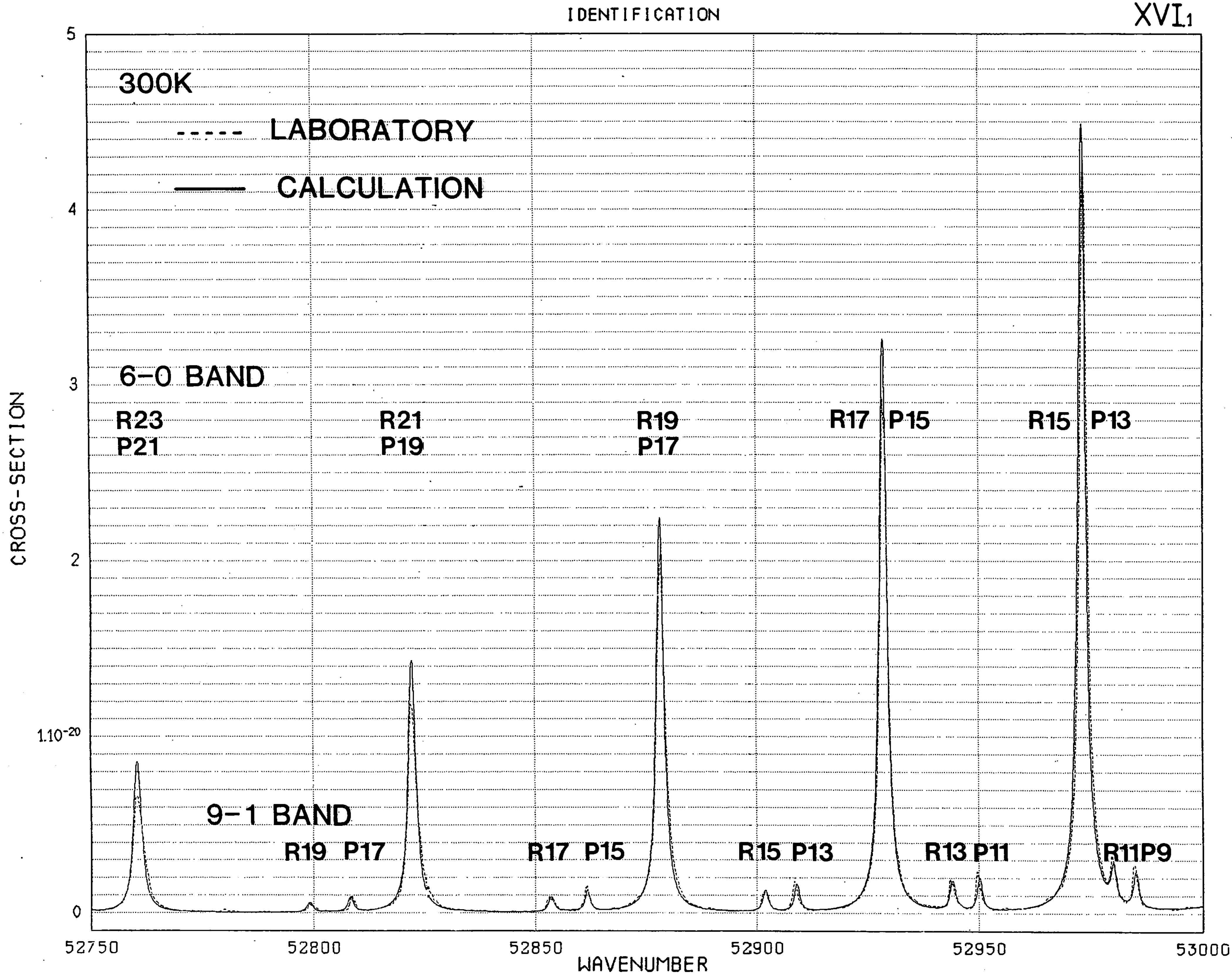
XV.10

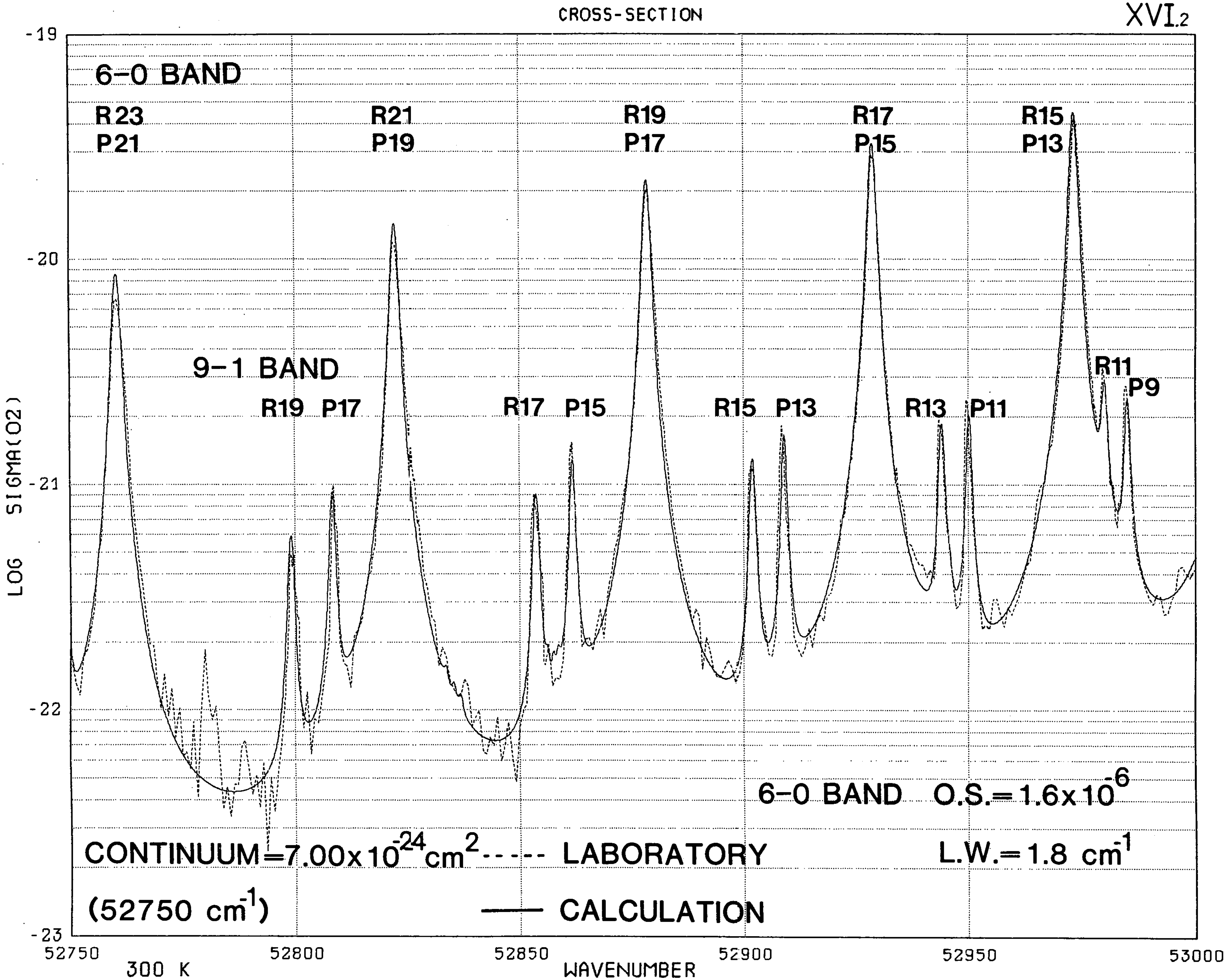

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
52500
52550
52600
52650
52700
52750
190 K
WAVENUMBER

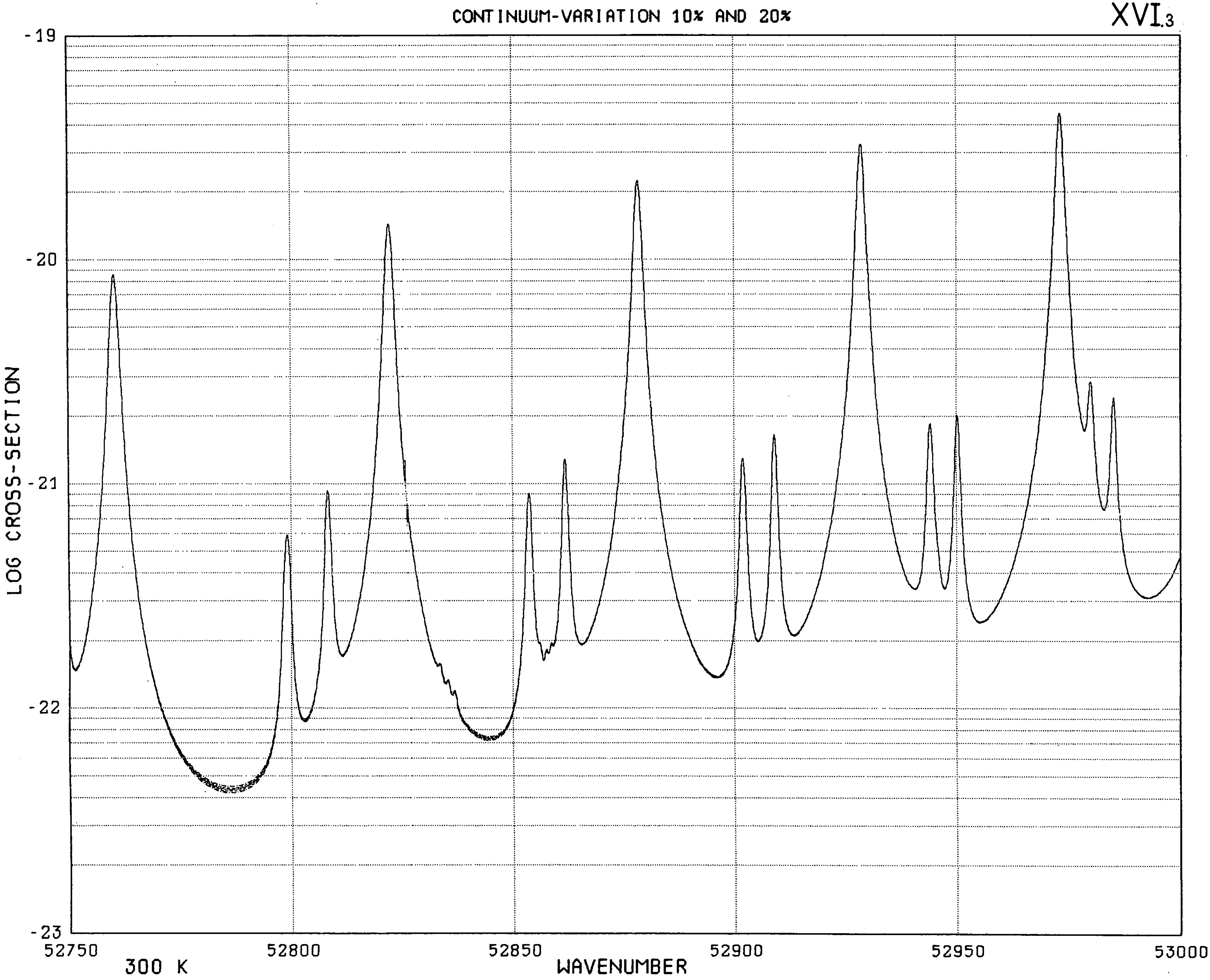
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
52750 - 53000 cm^{-1}

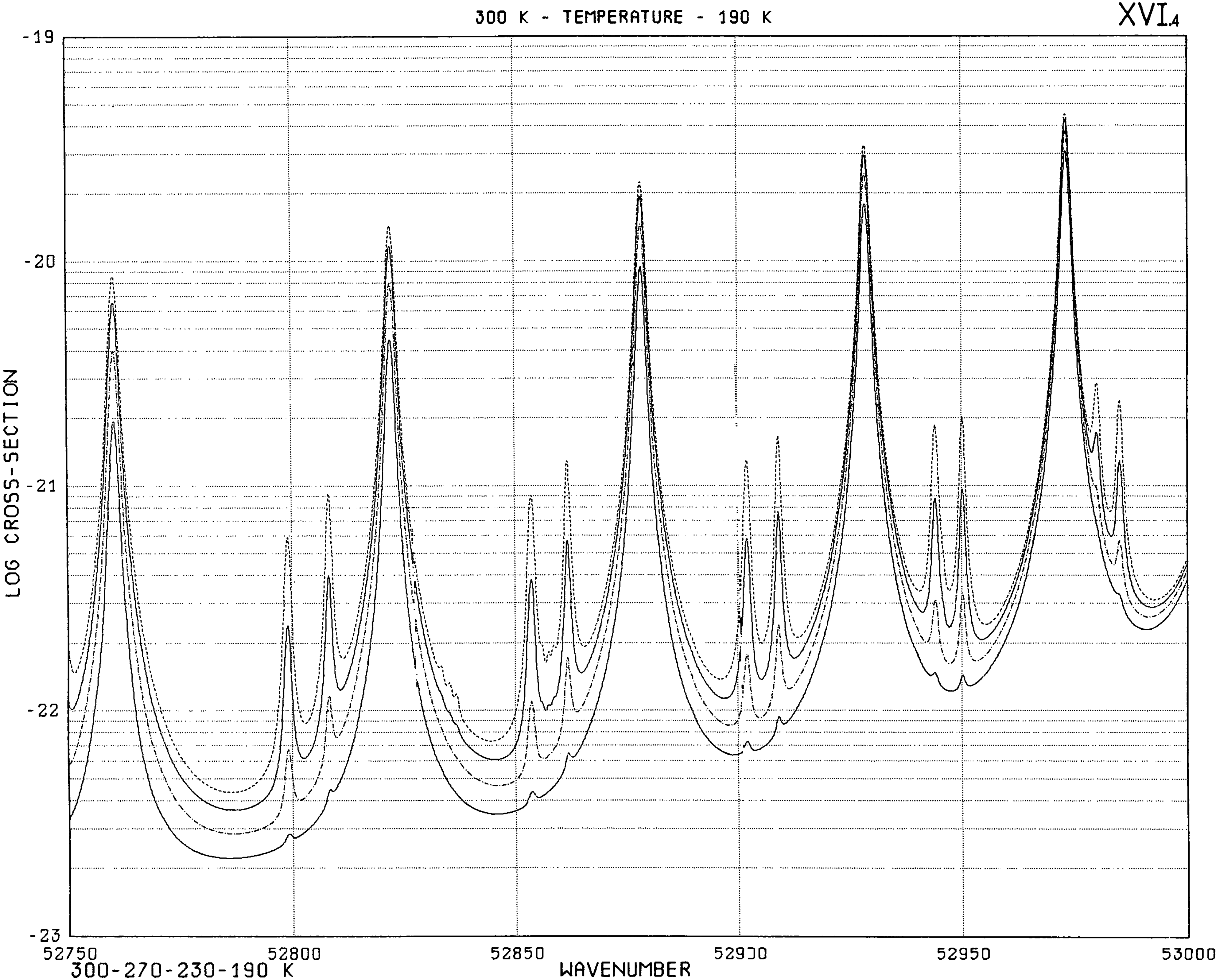
v	λ	band
52750		
52759.8	1895.38	6-0 R23
52760.0	1895.38	6-0 R23
52760.4	1895.36	6-0 P21
52760.5	1895.36	6-0 P21
52760.5	1895.36	6-0 R23
52760.9	1895.34	6-0 P21
52762.0	1895.30	10-1 P29
52763.5	1895.25	10-1 P29
52764.8	1895.20	10-1 P29
52798.7	1893.99	9-1 R19
52799.1	1893.97	9-1 R19
52799.4	1893.96	9-1 R19
52800		
52808.0	1893.65	9-1 P17
52808.3	1893.64	9-1 P17
52808.5	1893.63	9-1 P17
52821.7	1893.16	6-0 R21
52821.9	1893.15	6-0 R21
52822.2	1893.14	6-0 P19
52822.3	1893.14	6-0 P19
52822.4	1893.14	6-0 R21
52822.7	1893.13	6-0 P19
52833.6	1892.74	10-1 R29
52835.4	1892.67	10-1 R29
52836.9	1892.62	10-1 R29
52850		
52853.3	1892.03	9-1 R17
52853.7	1892.02	9-1 R17
52853.9	1892.01	9-1 R17
52856.1	1891.93	10-1 P27
52857.5	1891.88	10-1 P27
52858.6	1891.84	10-1 P27
52861.5	1891.74	9-1 P15
52861.8	1891.73	9-1 P15
52862.0	1891.72	9-1 P15
52877.9	1891.15	6-0 R19
52878.0	1891.15	6-0 R19
52878.3	1891.14	6-0 P17
52878.3	1891.13	6-0 P17
52878.5	1891.13	6-0 R19
52878.7	1891.12	6-0 P17
52900		
52901.6	1890.30	9-1 R15
52902.0	1890.29	9-1 R15
52902.3	1890.28	9-1 R15
52908.8	1890.04	9-1 P13

v	λ	band
52909.1	1890.03	9-1 P13
52909.3	1890.03	9-1 P13
52923.1	1889.53	10-1 R27
52924.8	1889.48	10-1 R27
52926.1	1889.43	10-1 R27
52928.3	1889.35	6-0 R17
52928.4	1889.35	6-0 R17
52928.6	1889.34	6-0 P15
52928.6	1889.34	6-0 P15
52928.9	1889.33	6-0 R17
52929.0	1889.32	6-0 P15
52943.7	1888.80	10-1 P25
52943.8	1888.79	9-1 R13
52944.2	1888.78	9-1 R13
52944.4	1888.77	9-1 R13
52944.9	1888.76	10-1 P25
52945.9	1888.72	10-1 P25
52950		
52950.0	1888.57	9-1 P11
52950.3	1888.57	9-1 P11
52950.4	1888.56	9-1 P11
52971.9	1887.79	7-0 P29
52972.4	1887.77	7-0 P29
52972.9	1887.76	6-0 R15
52973.0	1887.75	6-0 R15
52973.1	1887.75	6-0 P13
52973.2	1887.75	6-0 P13
52973.2	1887.75	7-0 P29
52973.5	1887.74	6-0 R15
52973.5	1887.74	6-0 P13
52979.8	1887.51	9-1 R11
52980.1	1887.50	9-1 R11
52980.3	1887.49	9-1 R11
52985.0	1887.33	9-1 P 9
52985.2	1887.32	9-1 P 9
52985.4	1887.31	9-1 P 9

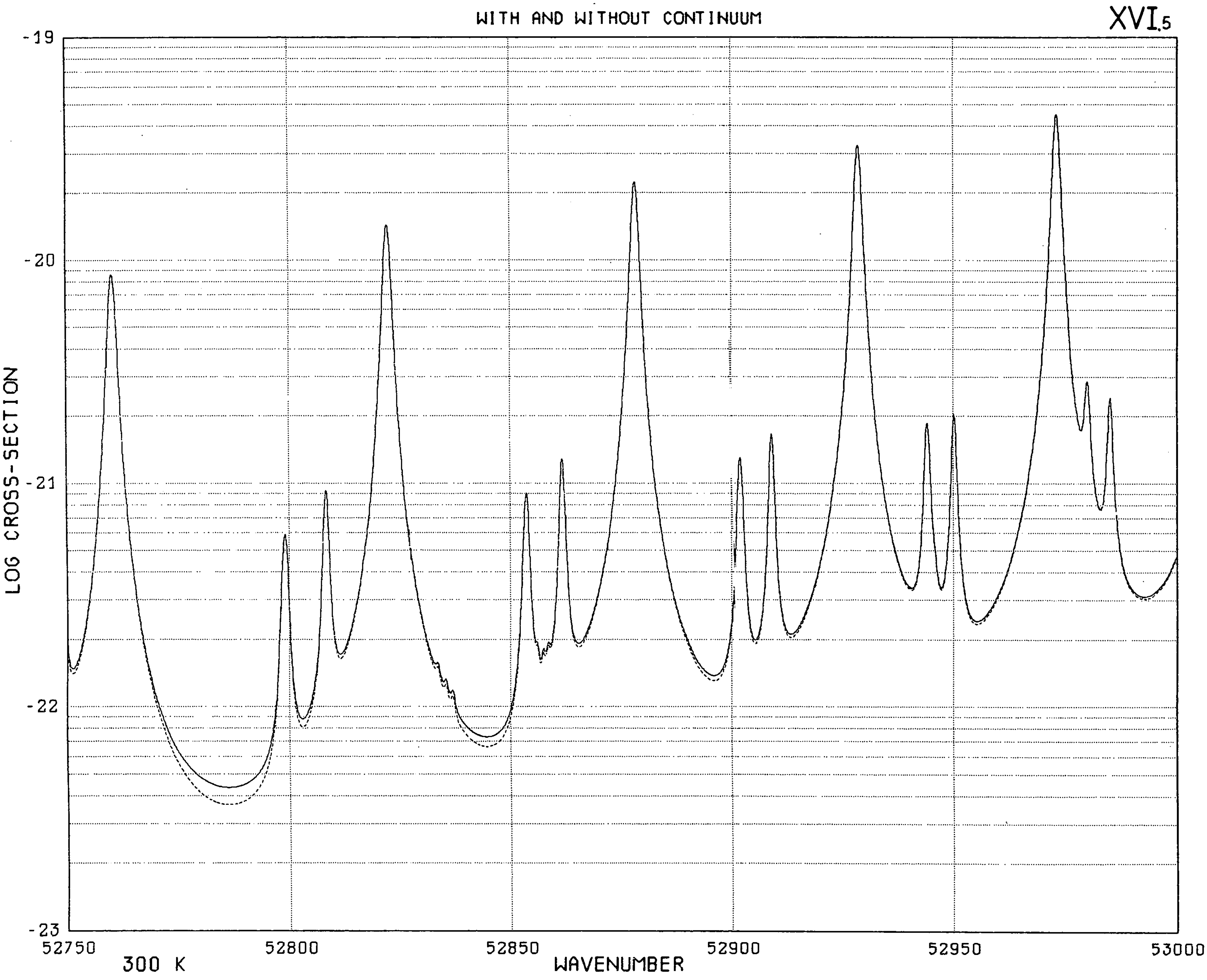

IDENTIFICATION
300K
LABORATORY
CALCULATION
6-0 BAND
R23
P21
R21
P19
R19
P17
R17 P15
R15 P13
9-1 BAND
R19 P17
R17 P15
R15 P13
R13 P11
R11P9
CROSS-SECTION
5
4
3
2
1.10-20
0
52750
52800
52850
52900
52950
53000
WAVENUMBER


CROSS-SECTION
6-0 BAND
R23 P21
R21 P19
R19 P17
R17 P15
R15 P13
9-1 BAND
R19 P17
R17 P15
R15 P13
R13 P11
R11 P9
6-0 BAND O.S.=1.6x10^-6
CONTINUUM=7.00x10^-24 cm^2 ----- LABORATORY
L.W.=1.8 cm^-1
(52750 cm^-1)
CALCULATION
LOG SIGMA(O2)
-19
-20
-21
-22
-23
52750
52800
52850
52900
52950
53000
300 K
WAVENUMBER


CONTINUUM-VARIATION 10% AND 20%
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52750
52800
52850
52900
52950
53000
300 K
WAVENUMBER

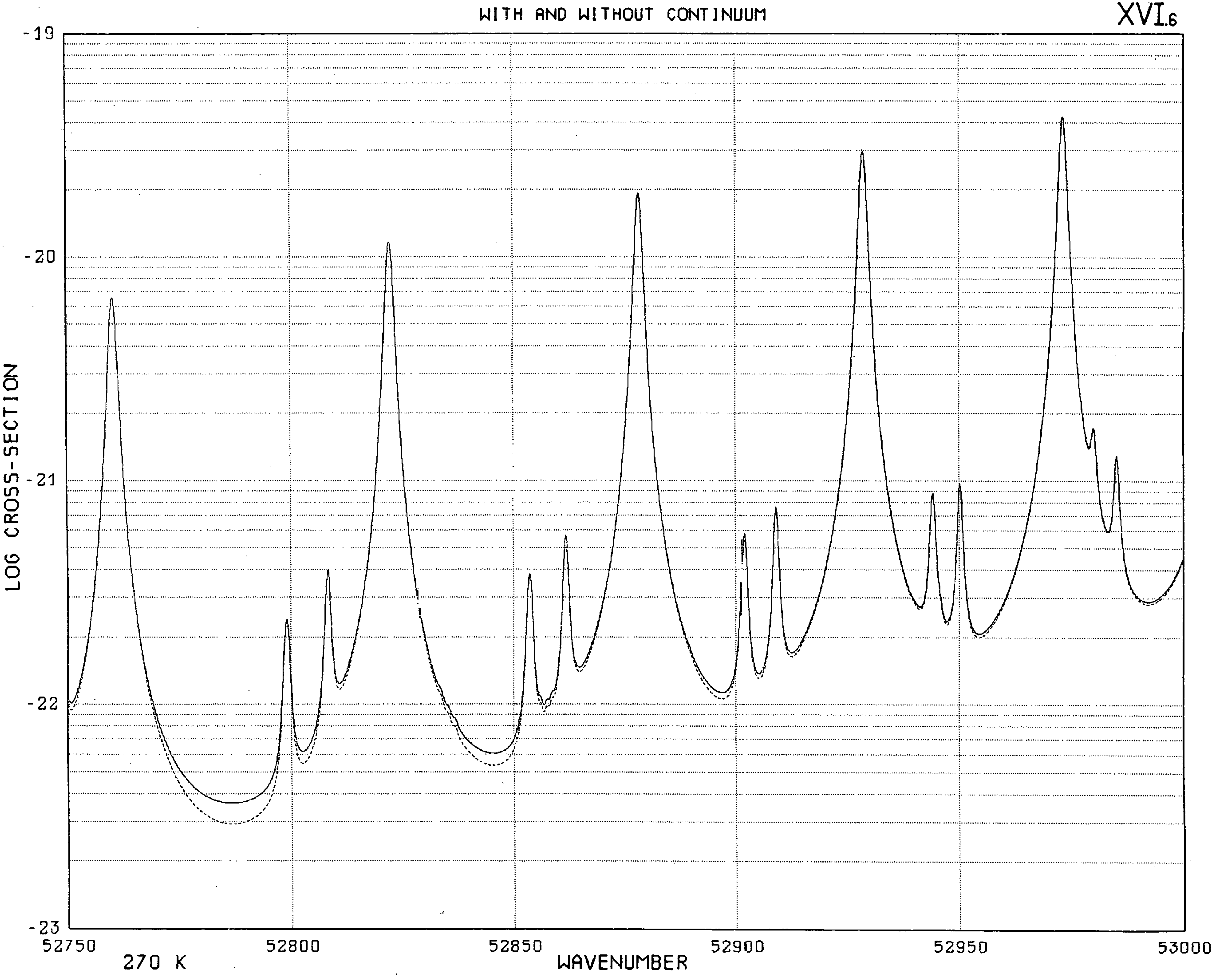


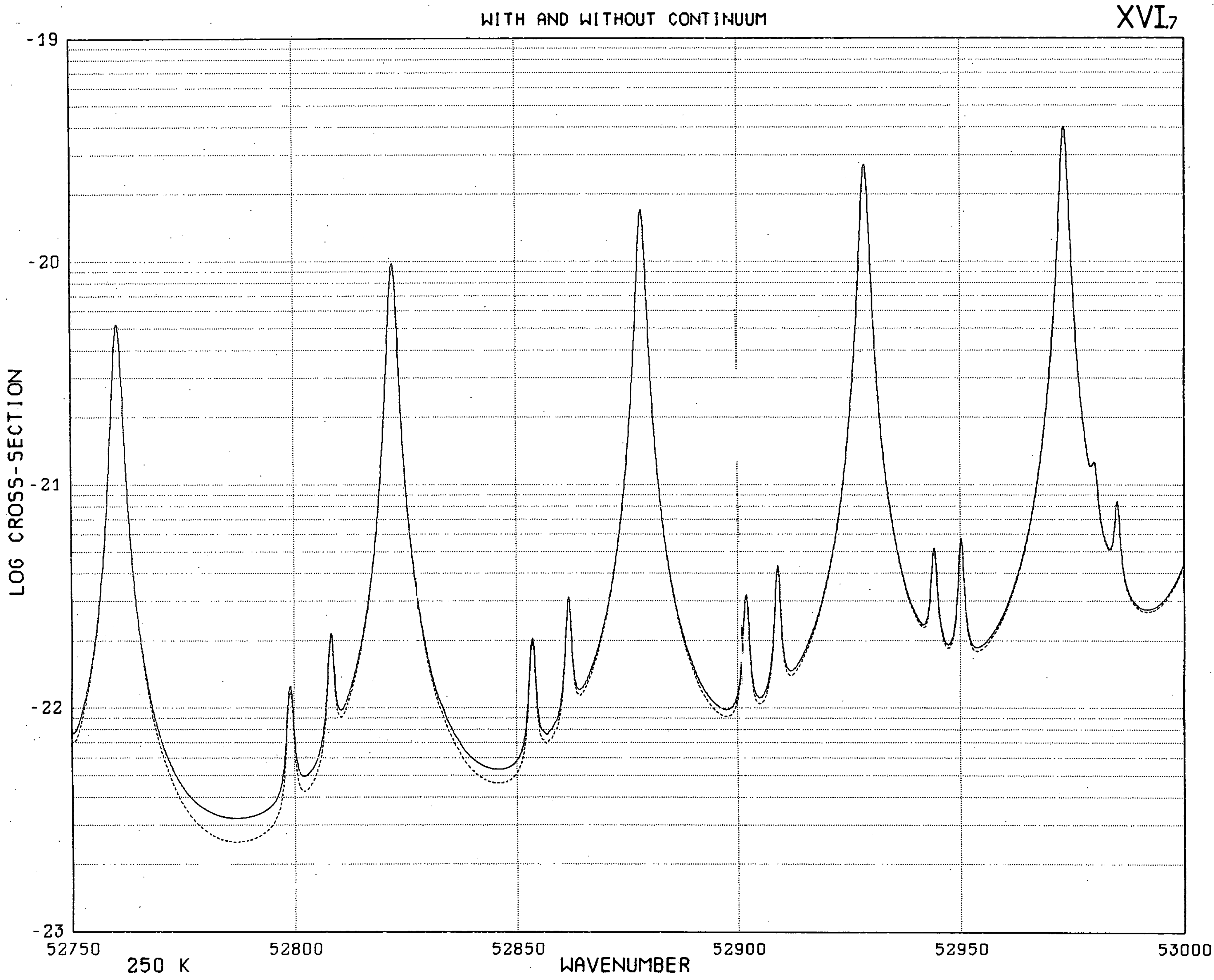
300 K - TEMPERATURE - 190 K
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52750
52800
52850
52900
52950
53000
WAVENUMBER
300-270-230-190 K

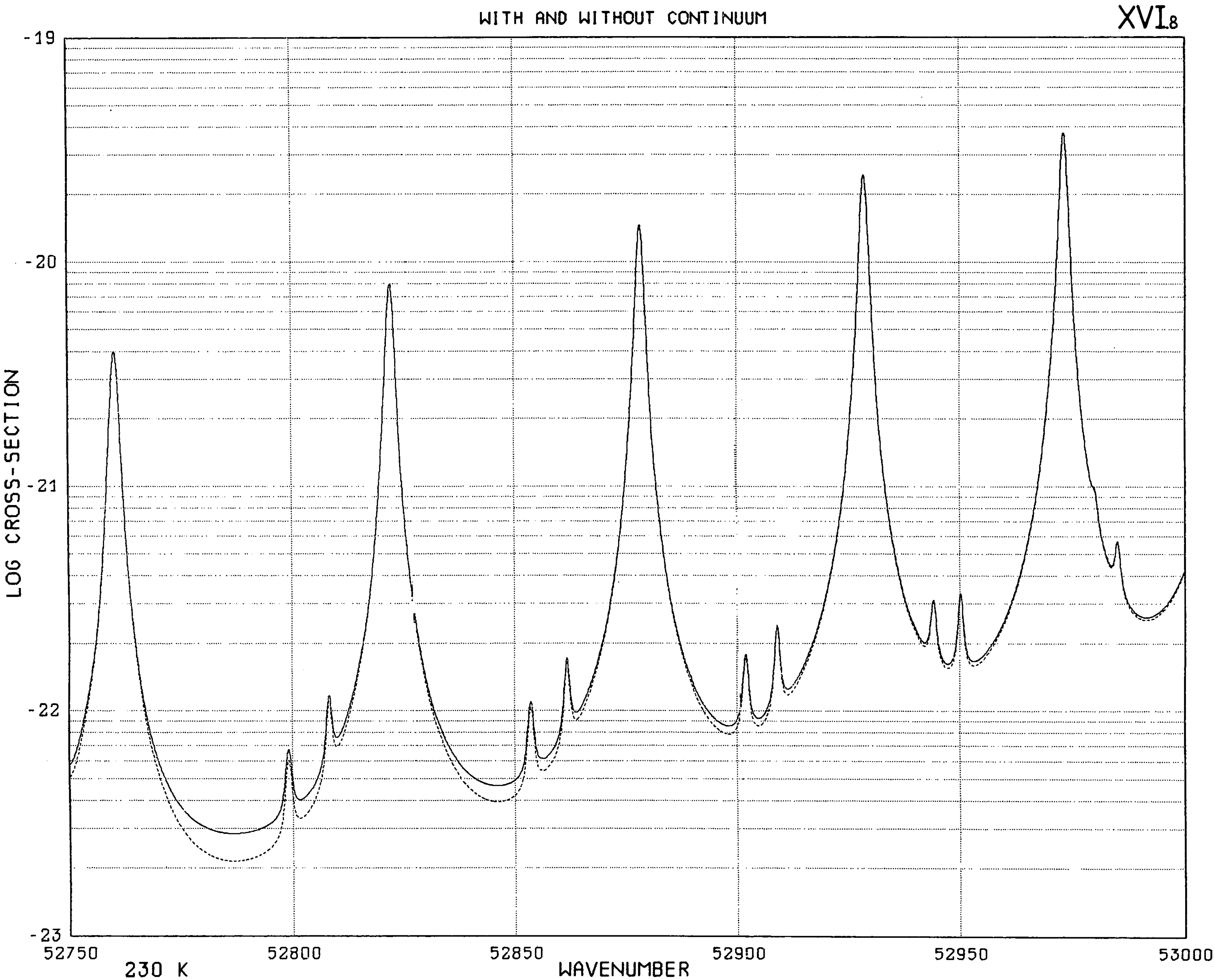


WITH AND WITHOUT CONTINUUM
XVI.5
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52750
52800
52850
52900
52950
53000
300 K
WAVENUMBER

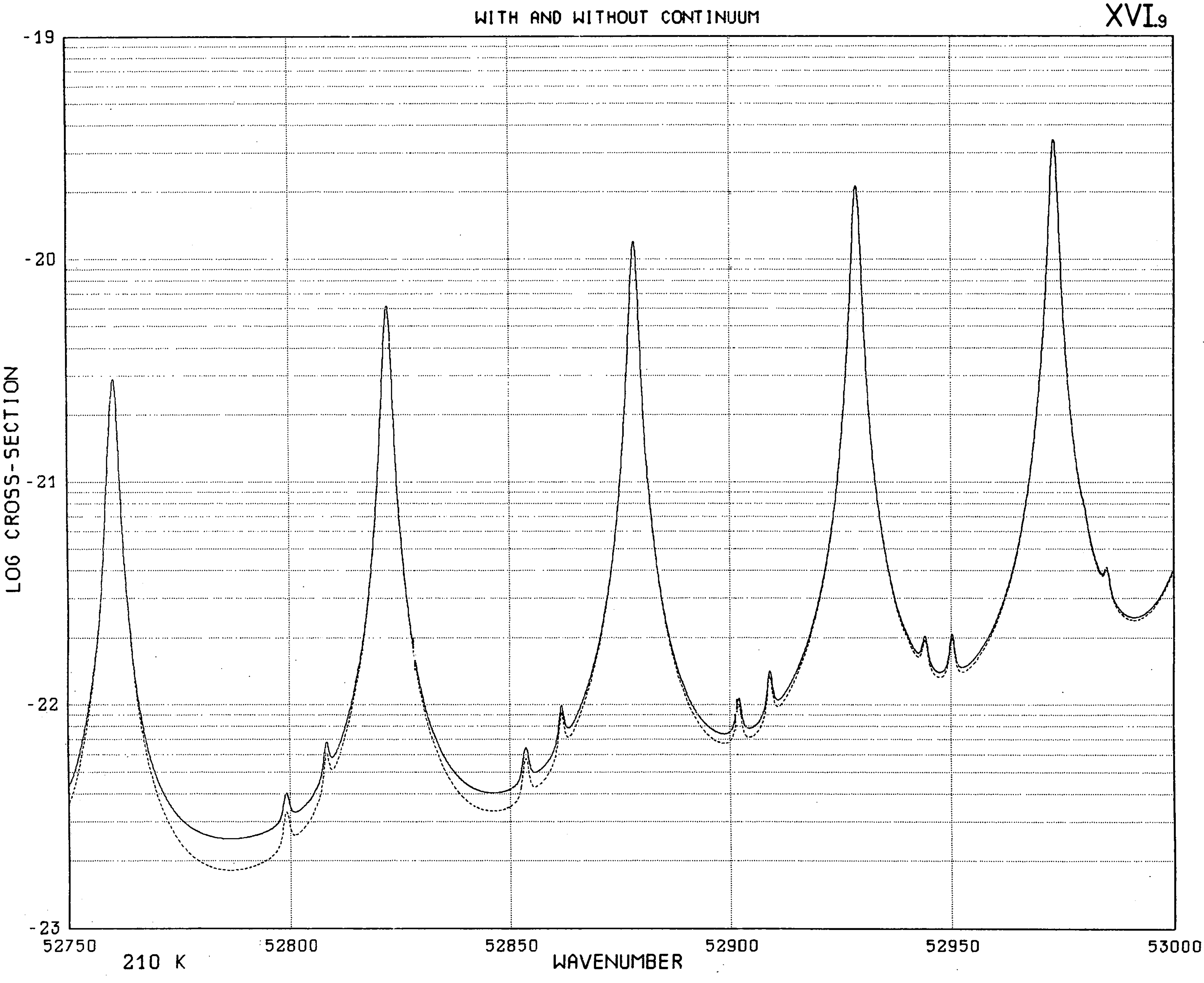
XVI.6

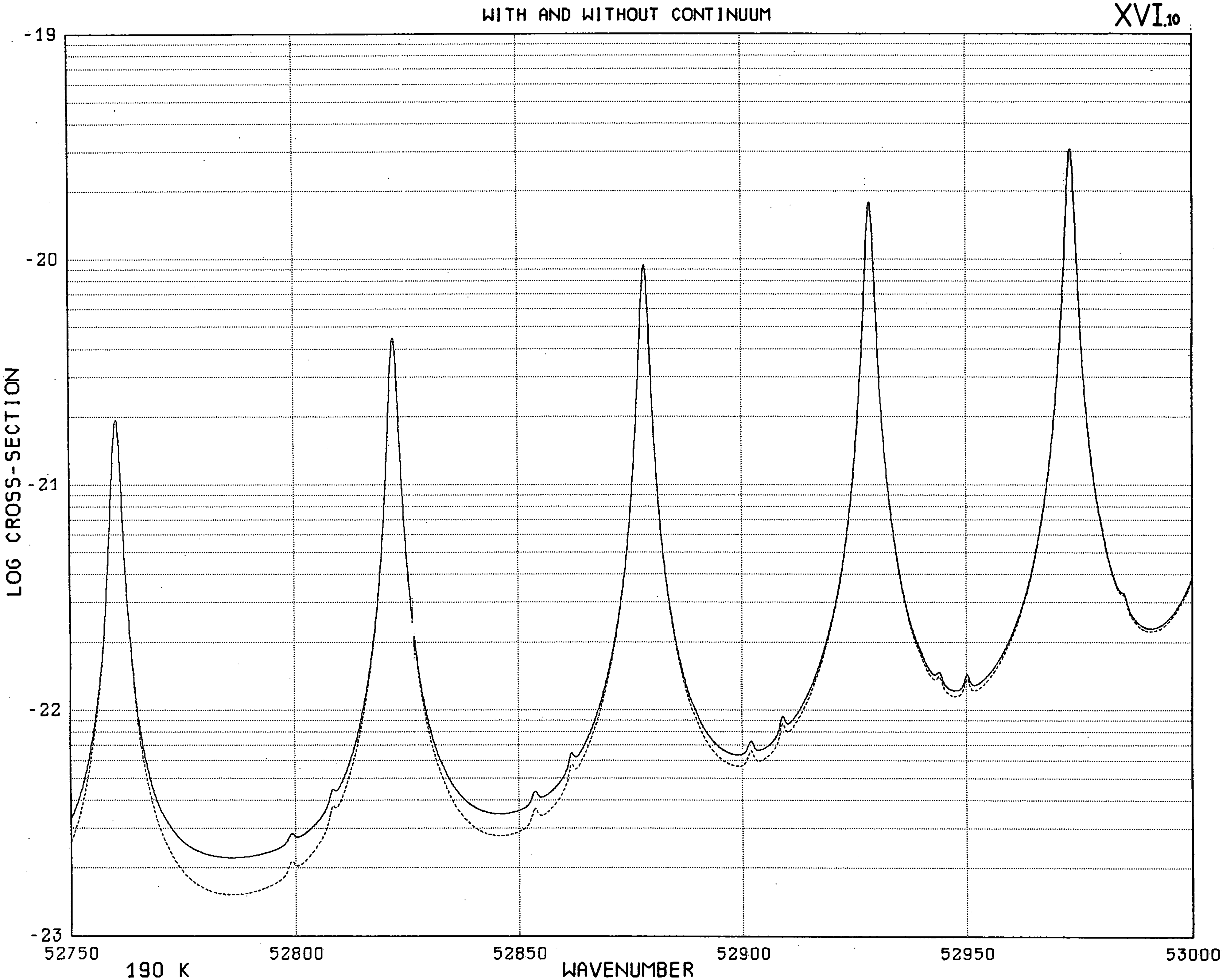

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52750
52800
52850
52900
52950
53000
270 K
WAVENUMBER


XVI.7
WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
52750
52800
52850
52900
52950
53000
250 K
WAVENUMBER



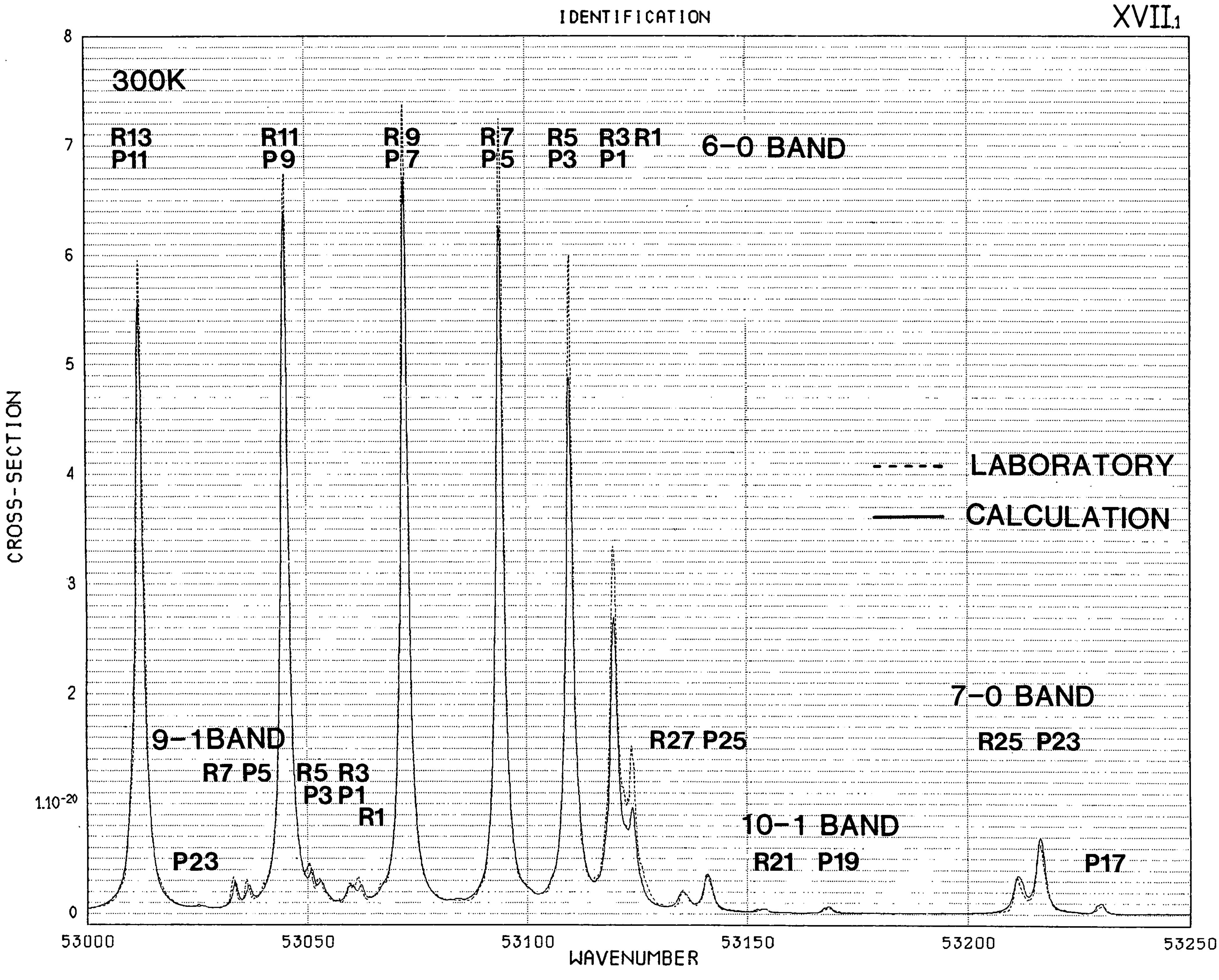
WITH AND WITHOUT CONTINUUM
XVI.8
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52750
52800
52850
52900
52950
53000
230 K
WAVENUMBER

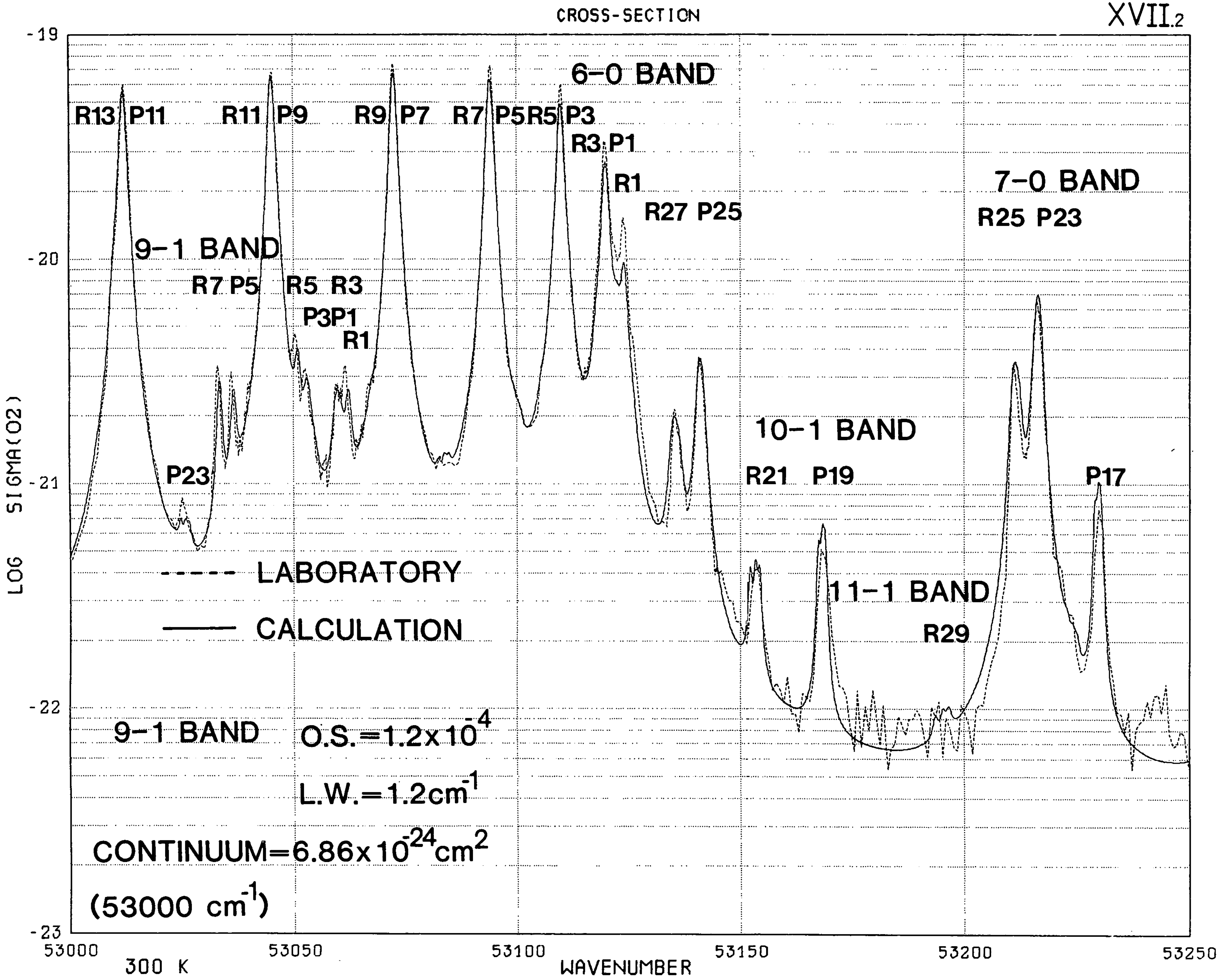

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52750
52800
52850
52900
52950
53000
WAVENUMBER
210 K

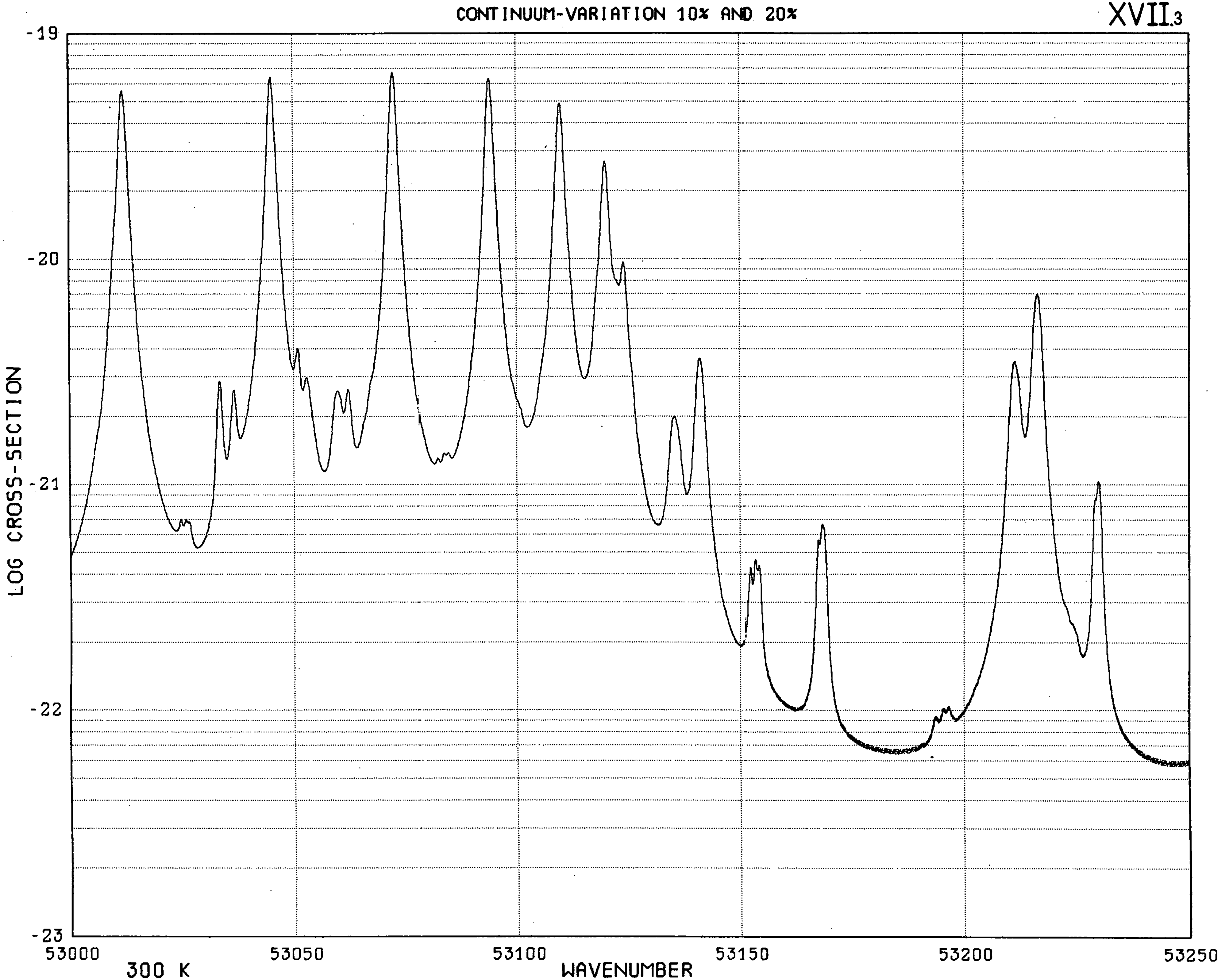

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
52750
52800
52850
52900
52950
53000
190 K
WAVENUMBER

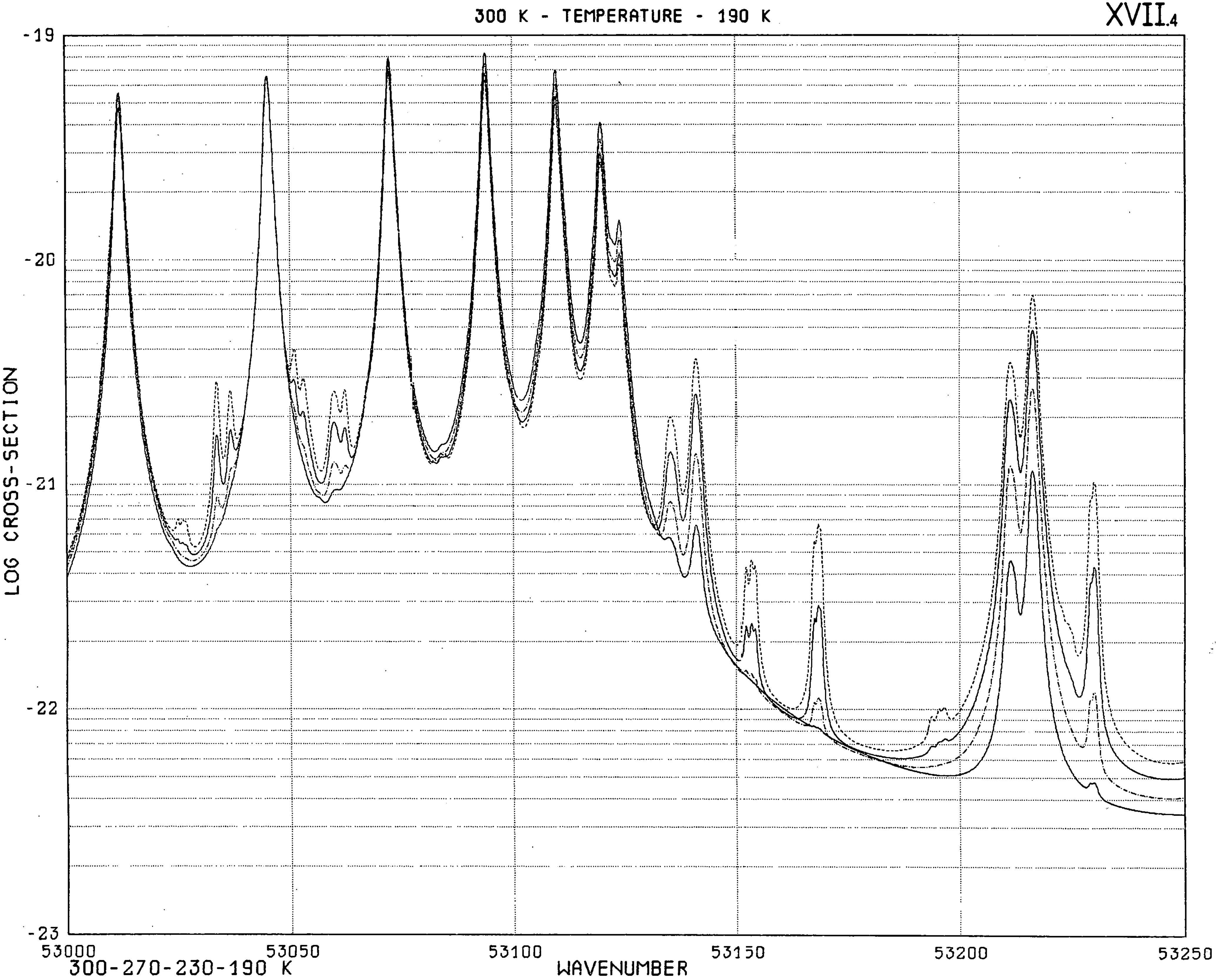
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
53000 - 53250 cm^{-1}

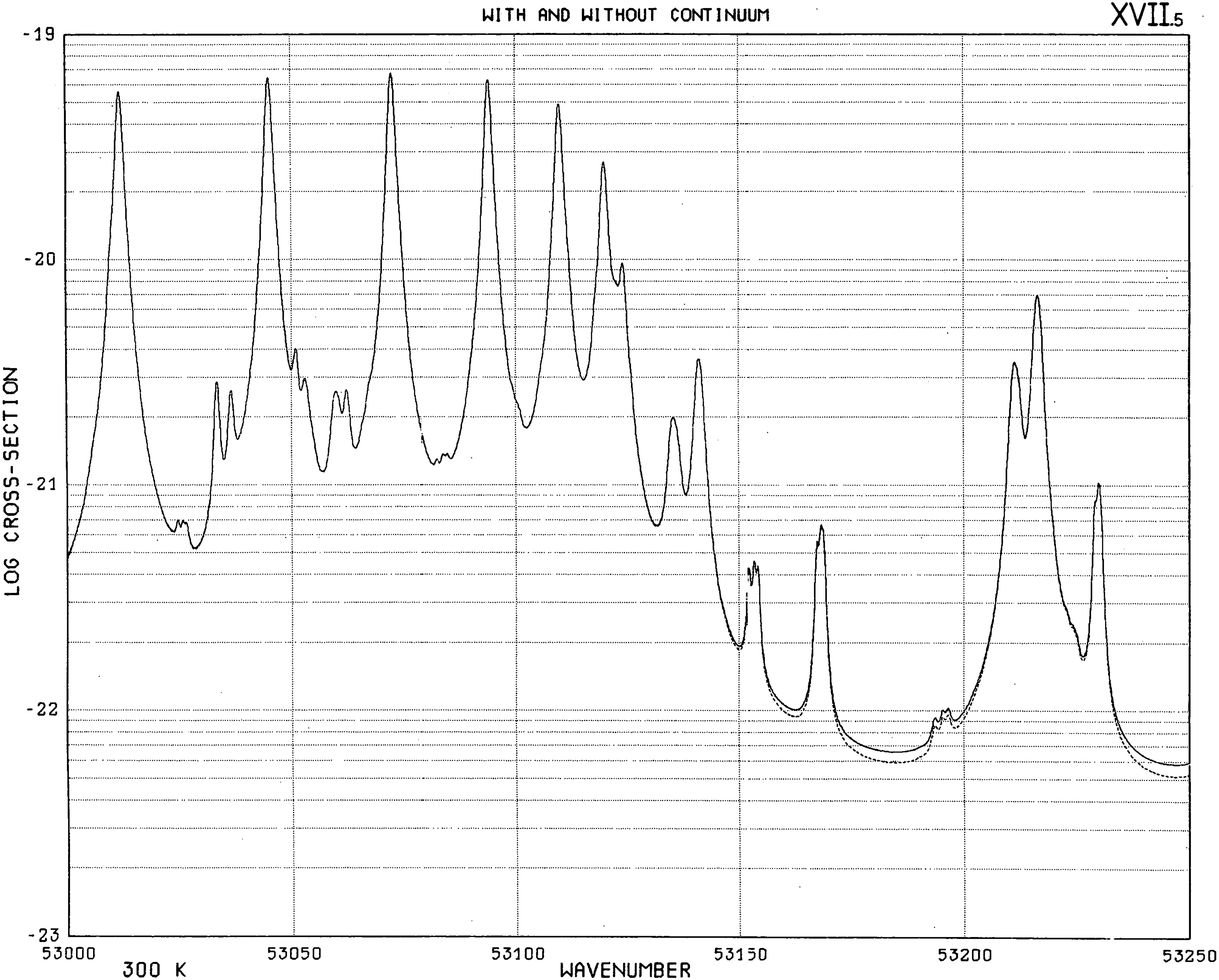
v	λ	band	v	λ	band	v	λ	band
53000						53150		
53006.0	1886.58	10-1 R25	53062.9	1884.55	9-1 P 1	53152.2	1881.39	10-1 R21
53007.5	1886.52	10-1 R25	53065.7	1884.46	9-1 Q 1	53153.4	1881.35	10-1 R21
53008.7	1886.48	10-1 R25	53067.0	1884.41	9-1 R 1	53154.3	1881.32	10-1 R21
53009.6	1886.45	9-1 R 9	53067.4	1884.40	9-1 R 1	53167.5	1880.85	10-1 P19
53009.9	1886.44	9-1 R 9	53072.3	1884.22	6-0 R 9	53168.3	1880.82	10-1 P19
53010.1	1886.43	9-1 R 9	53072.3	1884.22	6-0 R 9	53169.0	1880.80	10-1 P19
53011.8	1886.37	6-0 R13	53072.3	1884.22	6-0 P 7	53193.6	1879.92	11-1 R29
53011.9	1886.37	6-0 R13	53072.4	1884.22	6-0 P 7	53195.4	1879.86	11-1 R29
53012.0	1886.37	6-0 P11	53072.7	1884.21	6-0 P 7	53196.6	1879.82	11-1 R29
53012.0	1886.37	6-0 P11	53072.7	1884.21	6-0 R 9	53200		
53012.3	1886.35	6-0 R13	53082.4	1883.86	10-1 R23	53210.9	1879.32	7-0 R25
53012.3	1886.35	6-0 P11	53083.7	1883.82	10-1 R23	53211.4	1879.30	7-0 R25
53013.8	1886.30	9-1 P 7	53084.8	1883.78	10-1 R23	53212.2	1879.27	7-0 R25
53014.0	1886.29	9-1 P 7	53093.9	1883.46	6-0 R 7	53215.5	1879.15	10-1 R19
53014.2	1886.29	9-1 P 7	53093.9	1883.46	6-0 R 7	53216.1	1879.13	7-0 P23
53024.8	1885.91	10-1 P23	53093.9	1883.46	6-0 P 5	53216.4	1879.12	7-0 P23
53025.9	1885.87	10-1 P23	53094.0	1883.45	6-0 P 5	53216.6	1879.11	10-1 R19
53026.7	1885.84	10-1 P23	53094.3	1883.44	6-0 P 5	53216.9	1879.10	7-0 P23
53033.3	1885.61	9-1 R 7	53094.3	1883.44	6-0 R 7	53217.4	1879.09	10-1 R19
53033.5	1885.60	9-1 R 7	53099.3	1883.26	10-1 P21	53222.9	1878.89	11-1 P27
53033.7	1885.59	9-1 R 7	53100			53224.3	1878.84	11-1 P27
53036.4	1885.50	9-1 P 5	53100.3	1883.23	10-1 P21	53225.2	1878.81	11-1 P27
53036.7	1885.49	9-1 P 5	53101.0	1883.20	10-1 P21	53229.1	1878.67	10-1 P17
53036.9	1885.48	9-1 P 5	53109.7	1882.90	6-0 R 5	53229.9	1878.64	10-1 P17
53044.9	1885.19	6-0 R11	53109.7	1882.90	6-0 P 3	53230.4	1878.63	10-1 P17
53045.0	1885.19	6-0 R11	53109.7	1882.89	6-0 R 5			
53045.0	1885.19	6-0 P 9	53109.8	1882.89	6-0 P 3			
53045.1	1885.19	6-0 P 9	53110.1	1882.88	6-0 R 5			
53045.4	1885.18	6-0 P 9	53110.2	1882.88	6-0 P 3			
53045.4	1885.18	6-0 R11	53119.7	1882.54	6-0 P 1			
53050			53119.8	1882.54	6-0 R 3			
53050.7	1884.99	9-1 R 5	53119.8	1882.54	6-0 R 3			
53051.0	1884.98	9-1 R 5	53120.2	1882.52	6-0 R 3			
53051.2	1884.97	9-1 R 5	53122.5	1882.44	6-0 Q 1			
53052.6	1884.92	7-0 R29	53124.0	1882.39	6-0 R 1			
53052.8	1884.91	9-1 P 3	53124.1	1882.38	6-0 R 1			
53053.1	1884.90	9-1 P 3	53125.5	1882.33	11-1 P29			
53053.4	1884.89	7-0 R29	53127.0	1882.28	11-1 P29			
53053.6	1884.89	9-1 P 3	53128.0	1882.24	11-1 P29			
53054.4	1884.86	7-0 R29	53134.8	1882.01	7-0 R27			
53059.3	1884.68	7-0 P27	53135.4	1881.98	7-0 R27			
53059.7	1884.67	7-0 P27	53136.3	1881.95	7-0 R27			
53060.5	1884.64	7-0 P27	53140.7	1881.80	7-0 P25			
53062.0	1884.59	9-1 R 3	53141.0	1881.79	7-0 P25			
53062.3	1884.58	9-1 R 3	53141.7	1881.76	7-0 P25			
53062.5	1884.57	9-1 R 3						

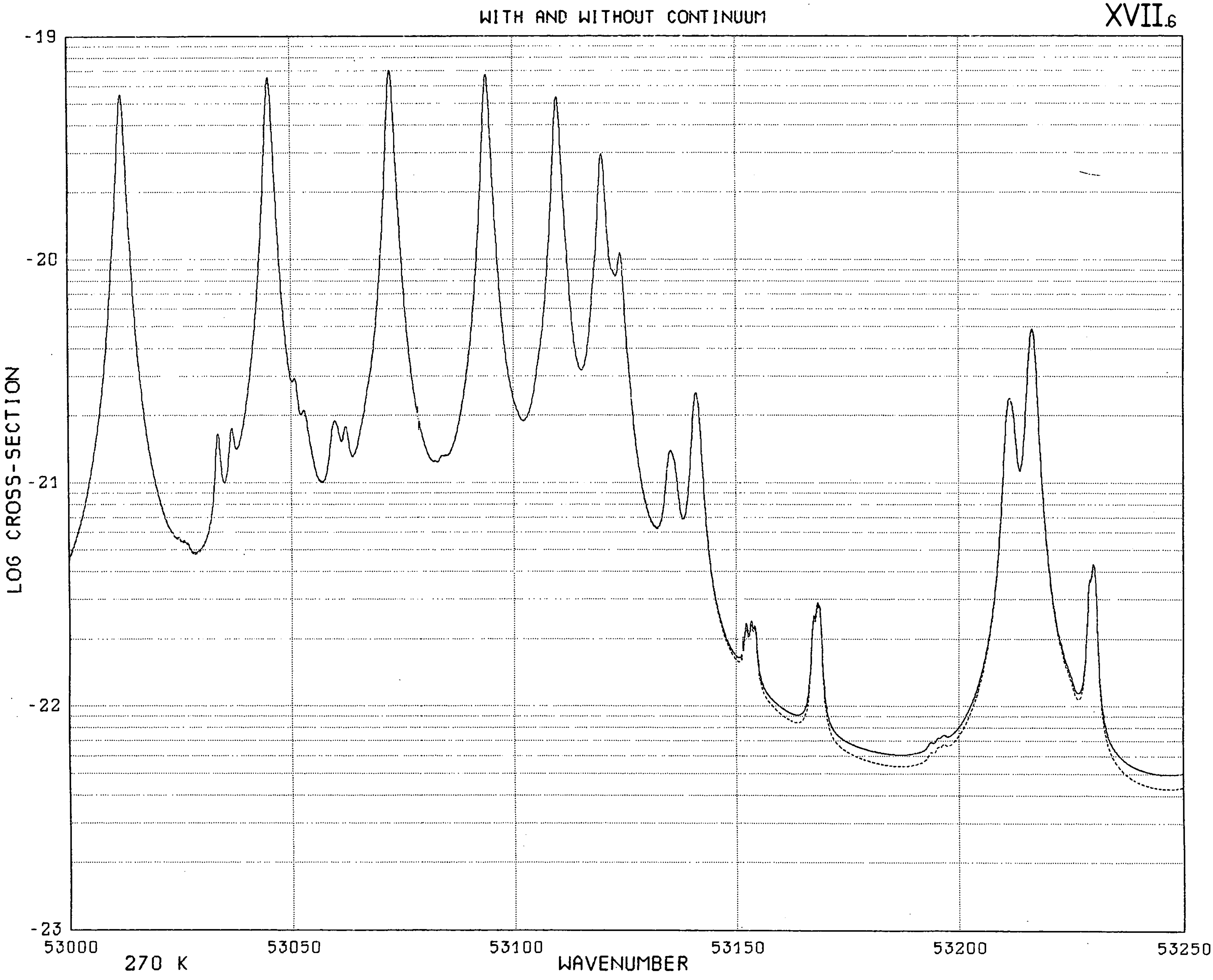

IDENTIFICATION
300K
R13 P11
R11 P9
R 9 P 7
R 7 P 5
R5 P3
R3 R1 P1
6–0 BAND
LABORATORY
CALCULATION
7–0 BAND
R25 P23
9–1BAND
R7 P5
R5 R3 P3 P1 R1
P23
R27 P25
10–1 BAND
R21 P19
P17
CROSS-SECTION
1.10^-20
0
1
2
3
4
5
6
7
8
53000
53050
53100
53150
53200
53250
WAVENUMBER

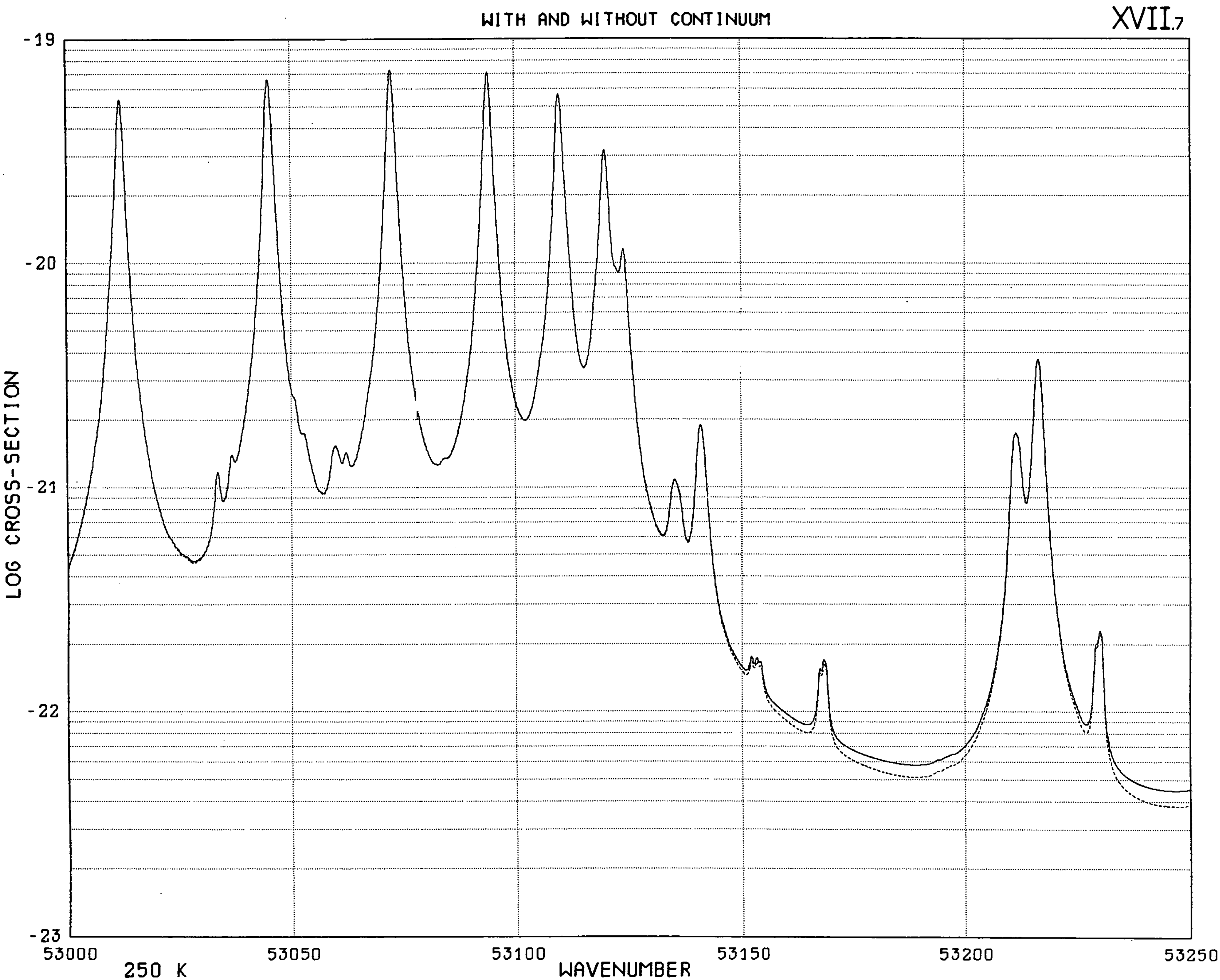

CROSS-SECTION
6-0 BAND
R13 P11
R11 P9
R9 P7
R7 P5R5 P3
R3 P1
R1
R27 P25
7-0 BAND
R25 P23
9-1 BAND
R7 P5
R5 R3
P3P1
R1
P23
10-1 BAND
R21 P19
P17
LABORATORY
CALCULATION
11-1 BAND
R29
9-1 BAND
O.S.=1.2x10^-4
L.W.=1.2cm^-1
CONTINUUM=6.86x10^-24 cm^2
(53000 cm^-1)
LOG SIGMA(O2)
-19
-20
-21
-22
-23
53000
53050
53100
53150
53200
53250
300 K
WAVENUMBER

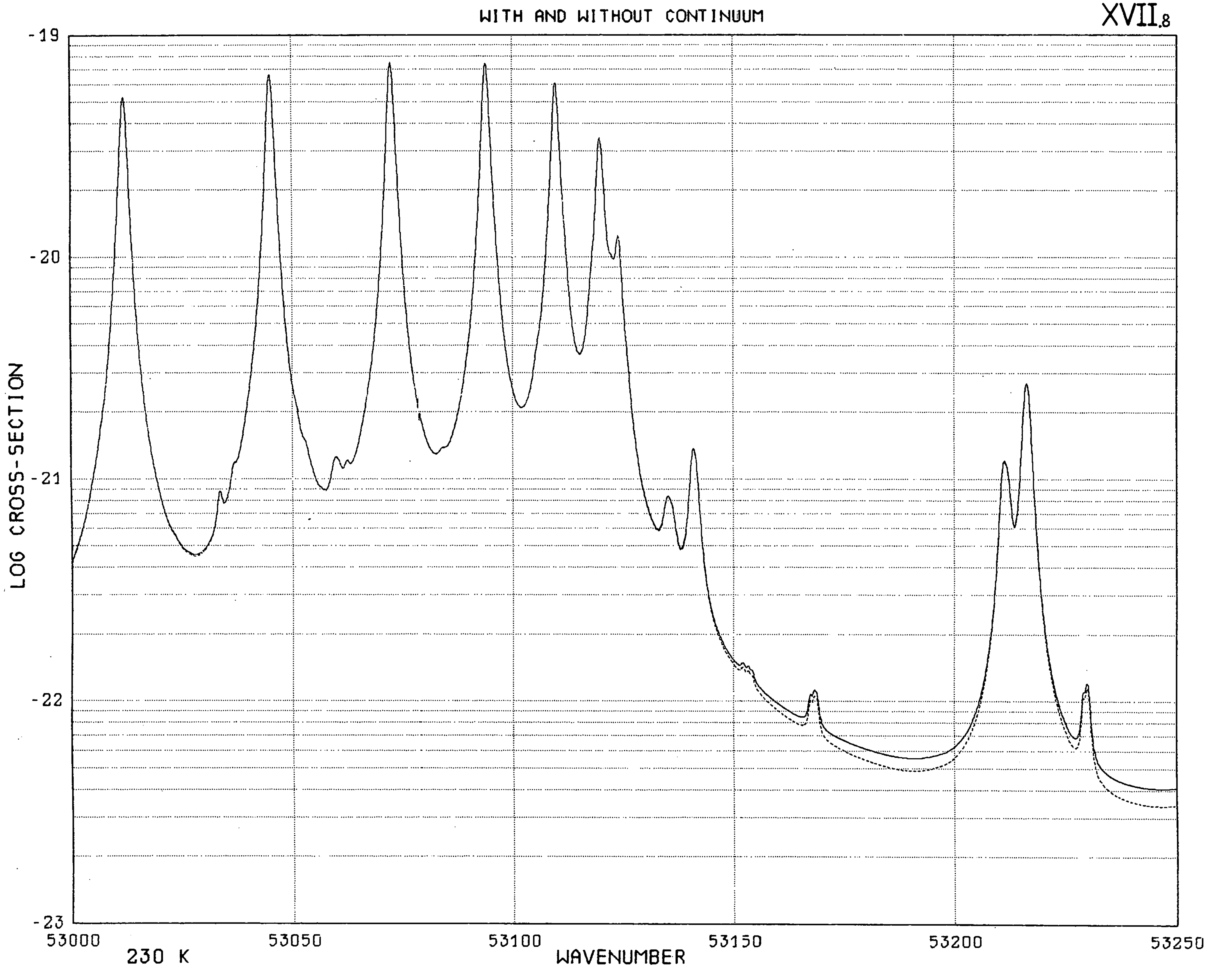

CONTINUUM-VARIATION 10% AND 20%
XVII.3
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53000
53050
53100
53150
53200
53250
300 K
WAVENUMBER

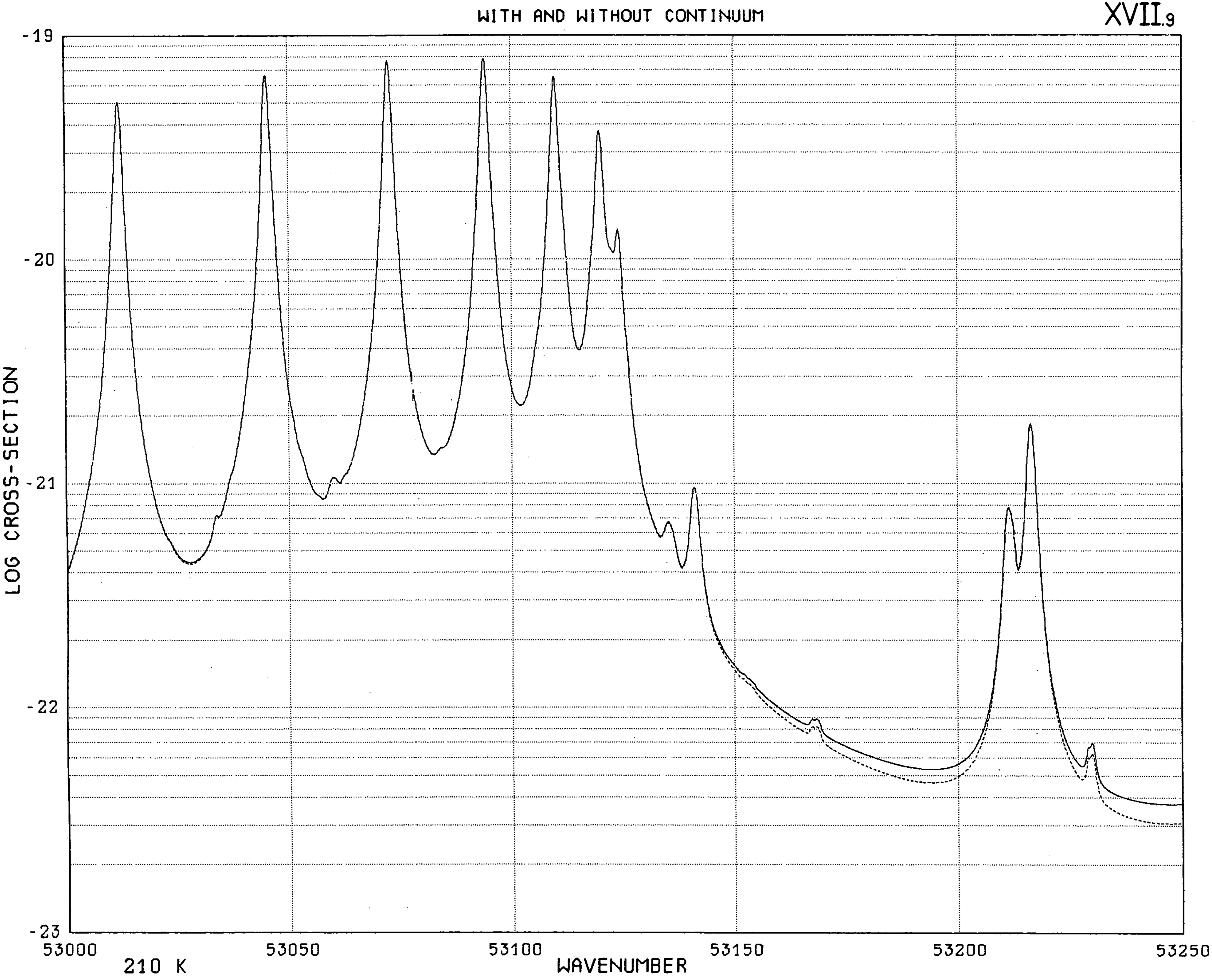

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53000
53050
53100
53150
53200
53250
WAVENUMBER
300-270-230-190 K

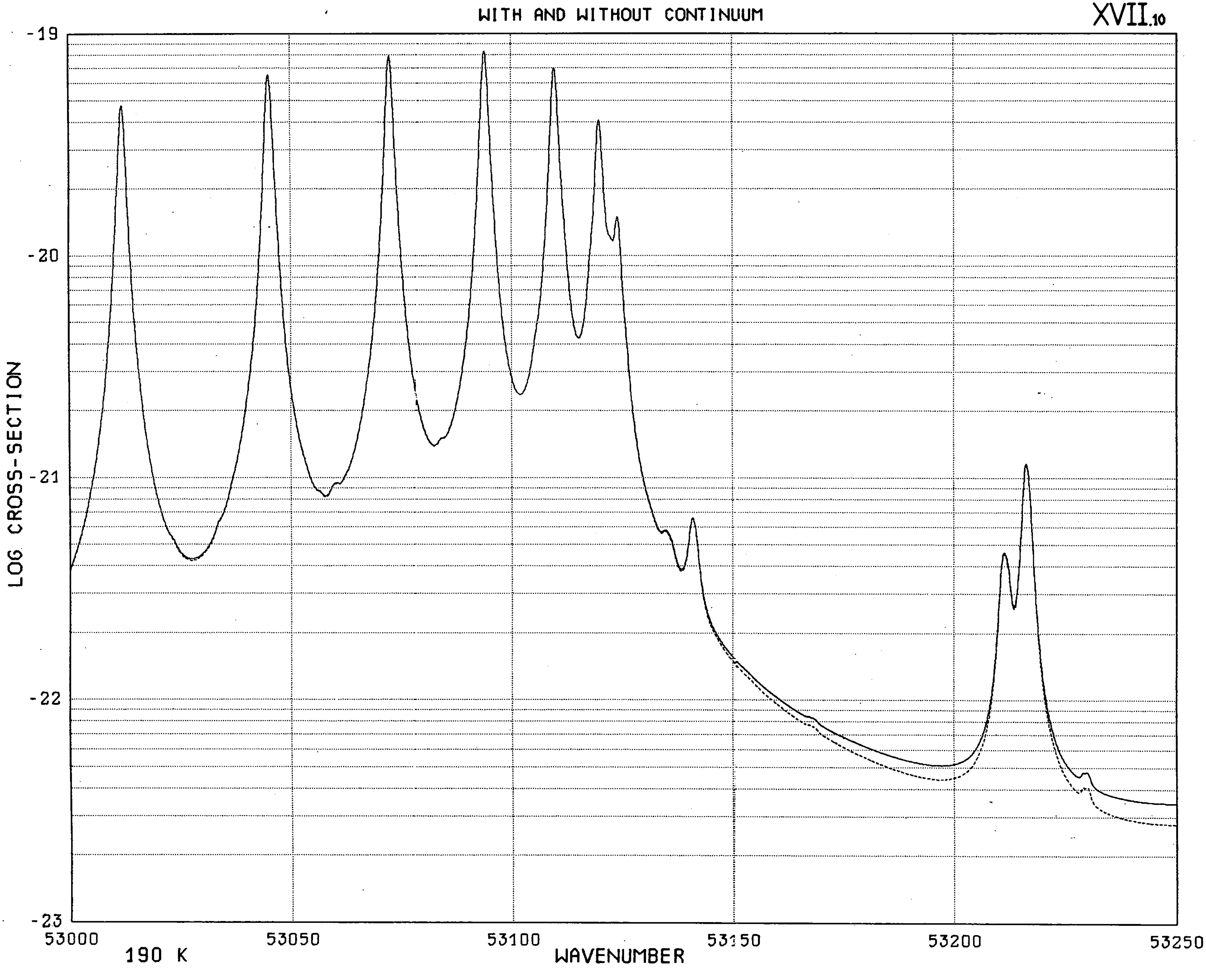

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53000
53050
53100
53150
53200
53250
300 K
WAVENUMBER


XVII.6
WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53000
53050
53100
53150
53200
53250
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53000
53050
53100
53150
53200
53250
250 K
WAVENUMBER

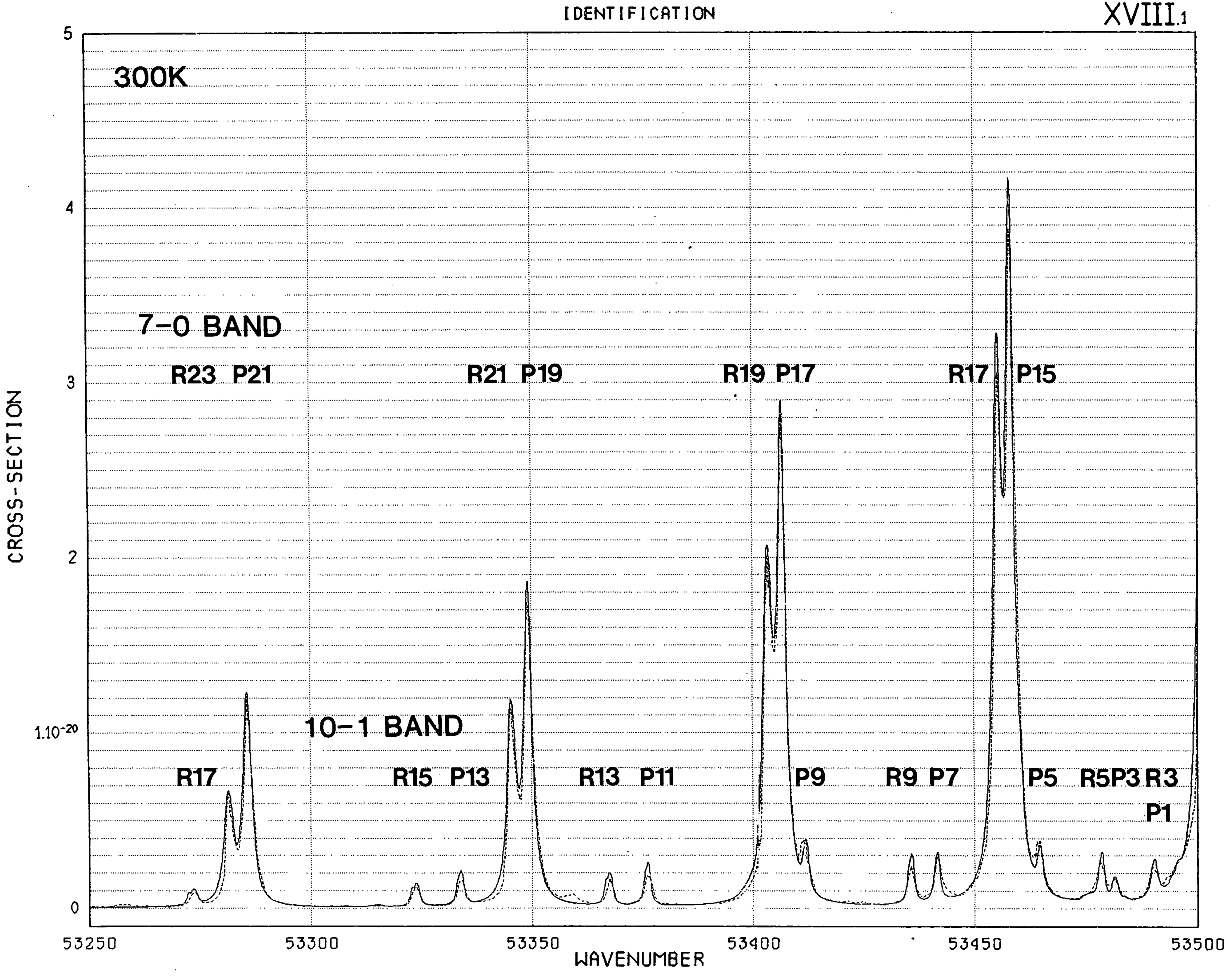

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53000
53050
53100
53150
53200
53250
230 K
WAVENUMBER

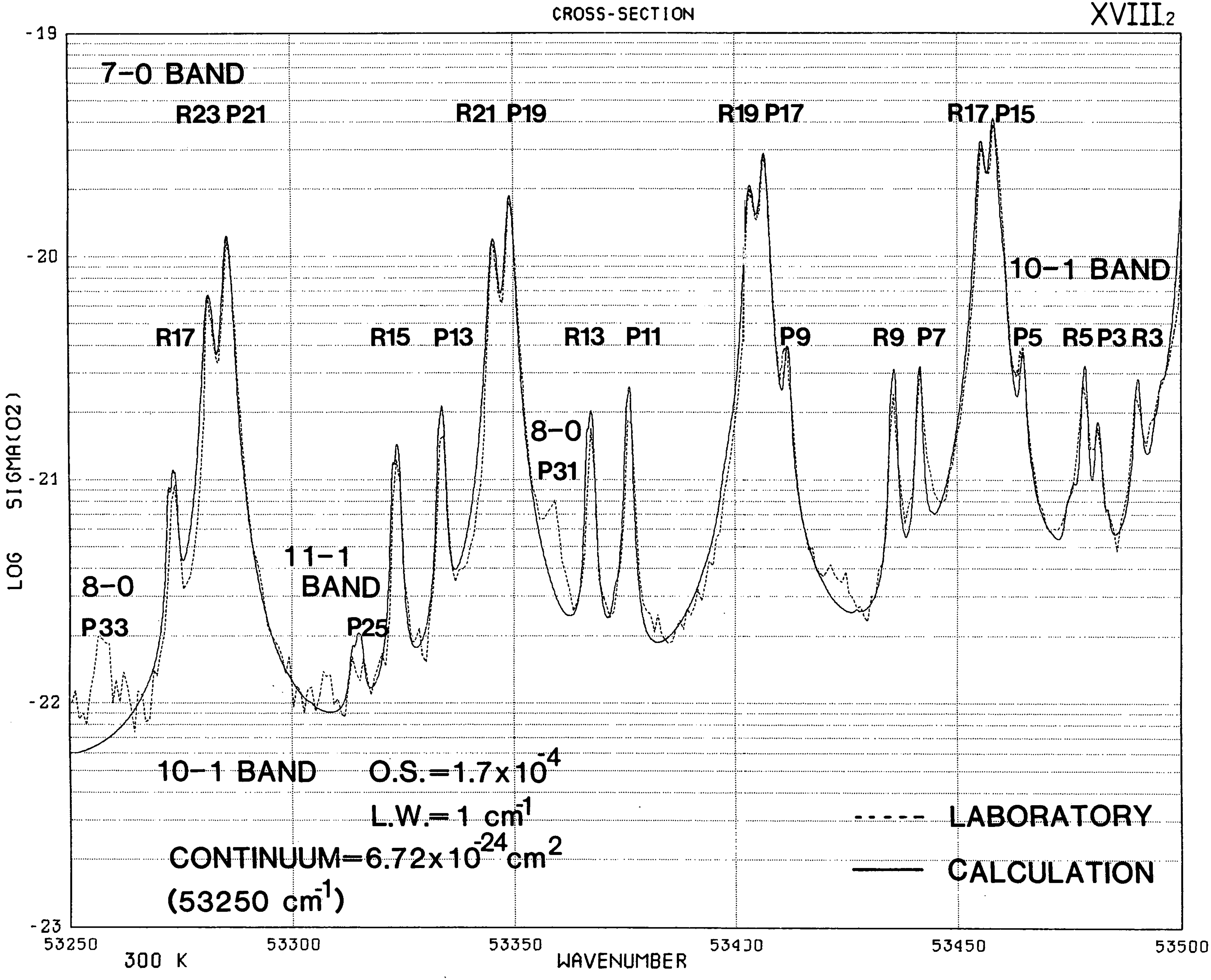

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53000
53050
53100
53150
53200
53250
210 K
WAVENUMBER

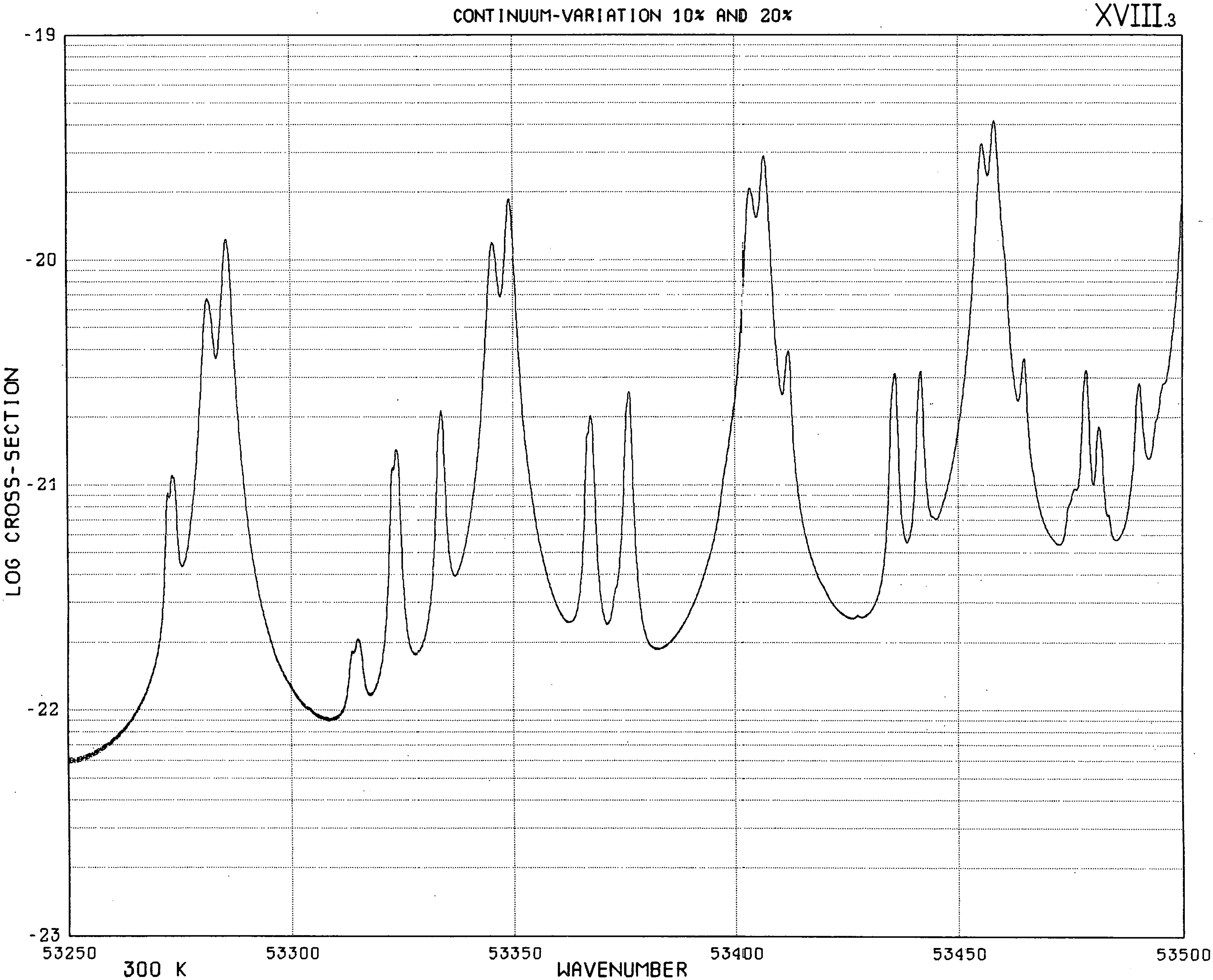

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53000
53050
53100
53150
53200
53250
190 K
WAVENUMBER

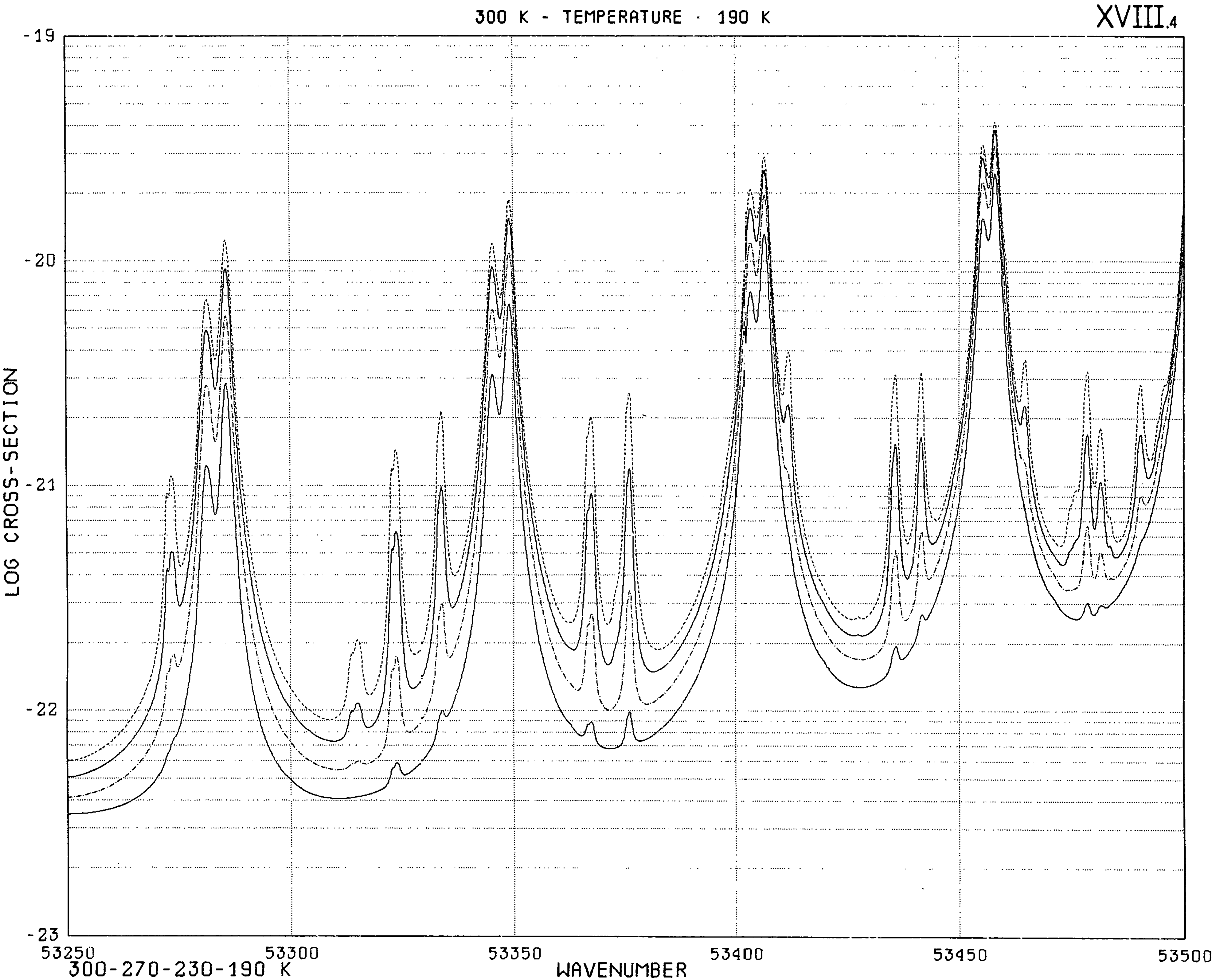
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
53250 - 53500 cm^{-1}

ν	λ	band	ν	λ	band	ν	λ	band
53250								
53272.4	1877.15	10-1 R17	53403.2	1872.54	7-0 R19	53481.6	1869.80	10-1 P 3
53273.3	1877.11	10-1 R17	53403.8	1872.52	7-0 R19	53482.1	1869.78	10-1 P 3
53274.0	1877.09	10-1 R17	53404.1	1872.51	10-1 R11	53489.9	1869.51	10-1 R 3
53280.9	1876.85	7-0 R23	53404.8	1872.49	10-1 R11	53490.4	1869.49	10-1 R 3
53281.4	1876.83	7-0 R23	53405.2	1872.48	10-1 R11	53490.7	1869.48	10-1 R 3
53282.1	1876.80	7-0 R23	53406.4	1872.43	7-0 P17	53491.5	1869.46	10-1 P 1
53284.3	1876.72	10-1 P15	53406.5	1872.43	7-0 P17	53494.2	1869.36	10-1 Q 1
53285.0	1876.70	10-1 P15	53407.0	1872.41	7-0 P17	53495.3	1869.32	10-1 R 1
53285.5	1876.68	7-0 P21	53411.5	1872.25	10-1 P 9	53495.9	1869.30	10-1 R 1
53285.5	1876.68	10-1 P15	53412.0	1872.24	10-1 P 9			
53285.7	1876.68	7-0 P21	53412.3	1872.23	10-1 P 9			
53286.2	1876.66	7-0 P21	53435.2	1871.43	10-1 R 9			
53286.6	1876.64	11-1 R27	53435.8	1871.40	10-1 R 9			
53288.2	1876.59	11-1 R27	53436.1	1871.39	10-1 R 9			
53289.4	1876.55	11-1 R27	53440.2	1871.25	12-1 P29			
53300			53441.2	1871.22	10-1 P 7			
53313.6	1875.70	11-1 P25	53441.6	1871.20	10-1 P 7			
53314.8	1875.65	11-1 P25	53441.9	1871.19	10-1 P 7			
53315.5	1875.63	11-1 P25	53442.7	1871.16	12-1 P29			
53322.7	1875.37	10-1 R15	53444.4	1871.10	12-1 P29			
53323.6	1875.34	10-1 R15	53450					
53324.1	1875.32	10-1 R15	53452.3	1870.83	11-1 R23			
53333.1	1875.01	10-1 P13	53453.5	1870.78	11-1 R23			
53333.8	1874.99	10-1 P13	53454.0	1870.77	8-0 P29			
53334.1	1874.97	10-1 P13	53454.4	1870.75	11-1 R23			
53344.9	1874.59	7-0 R21	53454.5	1870.75	8-0 P29			
53345.3	1874.58	7-0 R21	53455.0	1870.73	7-0 R17			
53346.0	1874.56	7-0 R21	53455.1	1870.73	8-0 P29			
53348.9	1874.45	7-0 P19	53455.2	1870.73	7-0 R17			
53349.1	1874.45	7-0 P19	53455.8	1870.71	7-0 R17			
53349.6	1874.43	7-0 P19	53457.9	1870.63	7-0 P15			
53350			53458.0	1870.63	7-0 P15			
53366.6	1873.83	10-1 R13	53458.4	1870.61	7-0 P15			
53367.4	1873.80	10-1 R13	53459.8	1870.56	10-1 R 7			
53367.9	1873.79	10-1 R13	53460.4	1870.54	10-1 R 7			
53372.8	1873.61	11-1 R25	53460.7	1870.53	10-1 R 7			
53374.3	1873.56	11-1 R25	53464.4	1870.40	10-1 P 5			
53375.3	1873.53	11-1 R25	53464.8	1870.39	10-1 P 5			
53375.5	1873.52	10-1 P11	53465.1	1870.38	10-1 P 5			
53376.1	1873.50	10-1 P11	53474.6	1870.05	11-1 P21			
53376.4	1873.49	10-1 P11	53475.6	1870.01	11-1 P21			
53397.5	1872.75	11-1 P23	53476.2	1869.99	11-1 P21			
53398.5	1872.71	11-1 P23	53478.1	1869.93	10-1 R 5			
53399.2	1872.69	11-1 P23	53478.6	1869.91	10-1 R 5			
53400			53478.9	1869.90	10-1 R 5			
53403.0	1872.56	7-0 R19	53481.2	1869.82	10-1 P 3			

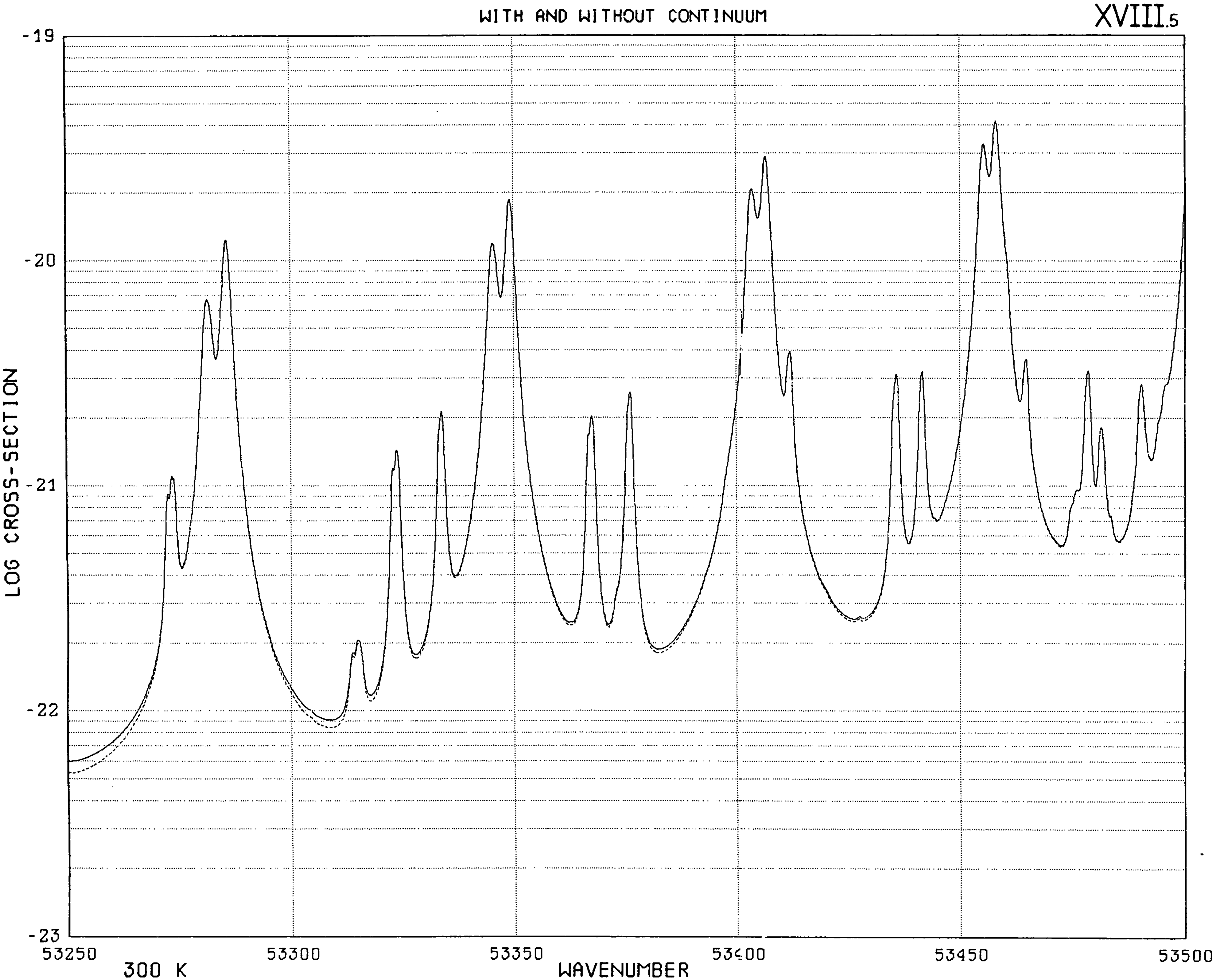

IDENTIFICATION
300K
7-0 BAND
R23 P21
R21 P19
R19 P17
R17 P15
10-1 BAND
R17
R15 P13
R13 P11
P9
R9 P7
P5
R5P3 R3
P1
CROSS-SECTION
5
4
3
2
1.10-20
0
WAVENUMBER
53250
53300
53350
53400
53450
53500


CROSS-SECTION
7-0 BAND
R23 P21
R21 P19
R19 P17
R17 P15
10-1 BAND
R17
R15 P13
R13 P11
P9
R9 P7
P5
R5 P3 R3
8-0
P31
11-1
BAND
8-0
P33
P25
10-1 BAND
O.S.=1.7x10-4
L.W.=1 cm-1
CONTINUUM=6.72x10-24 cm2
(53250 cm-1)
LABORATORY
CALCULATION
LOG SIGMA(O2)
-19
-20
-21
-22
-23
53250
53300
53350
53400
53450
53500
300 K
WAVENUMBER

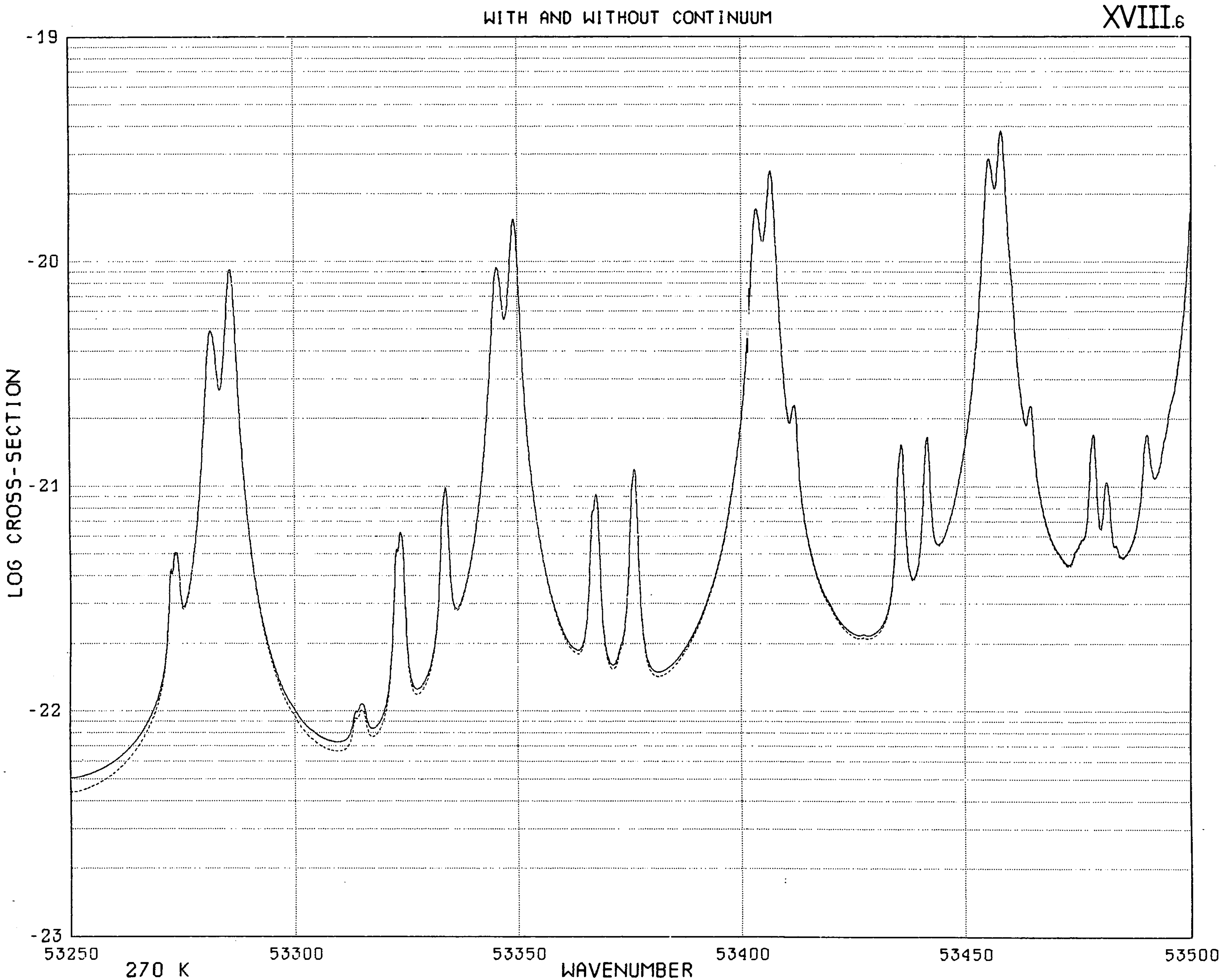

CONTINUUM-VARIATION 10% AND 20%
XVIII.3
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53250
53300
53350
53400
53450
53500
300 K
WAVENUMBER

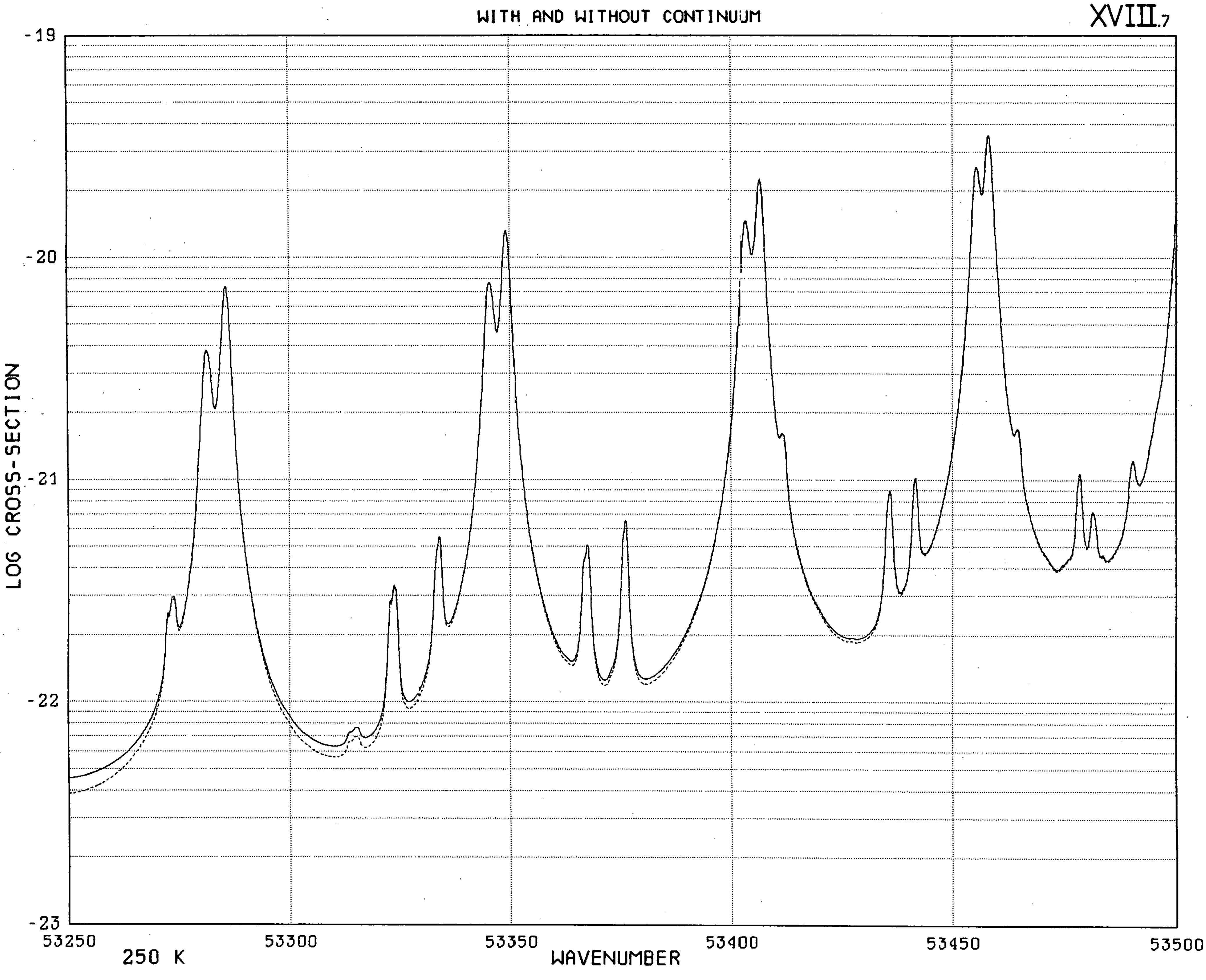

300 K - TEMPERATURE · 190 K
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53250
53300
53350
53400
53450
53500
300-270-230-190 K
WAVENUMBER

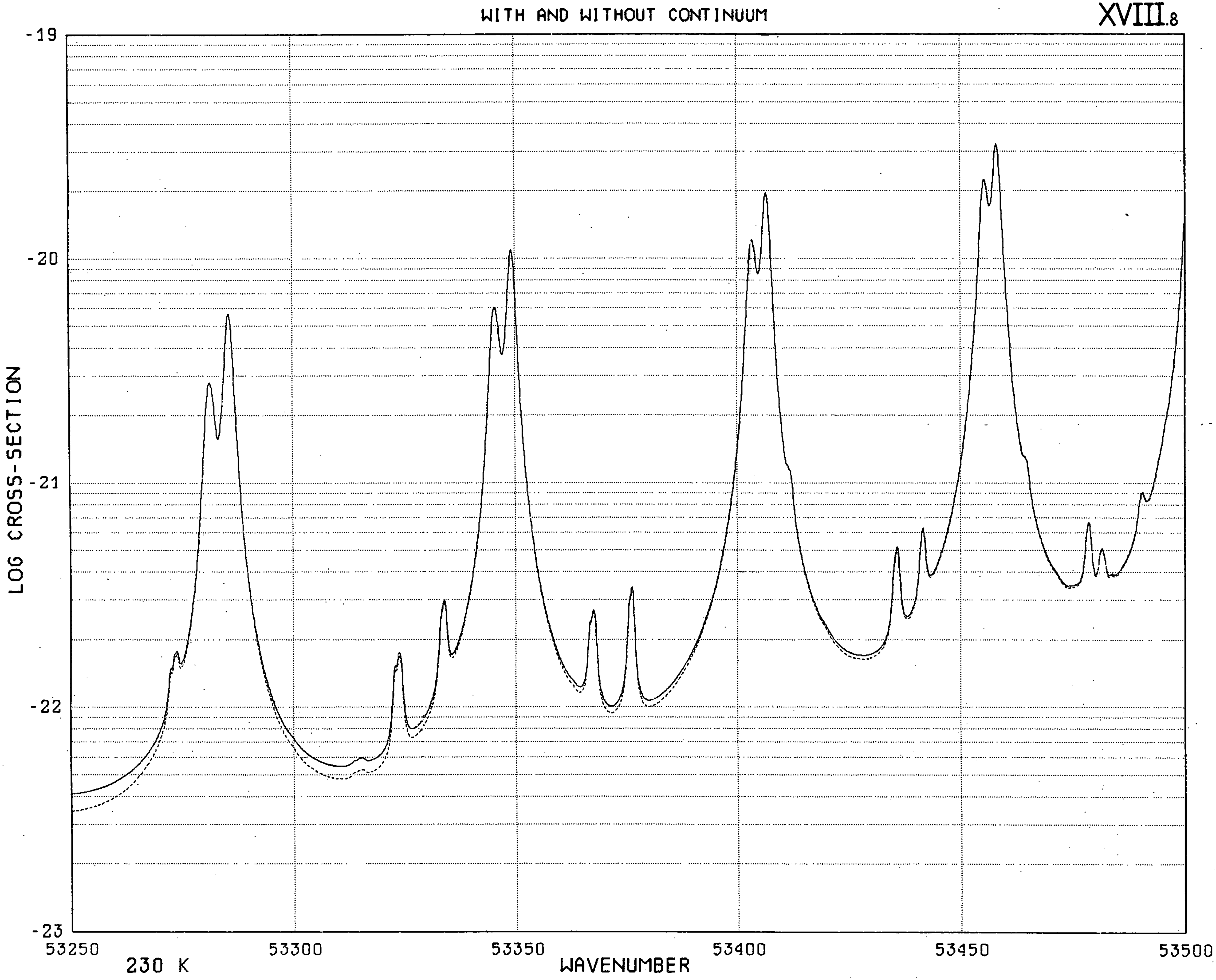
XVIII.5

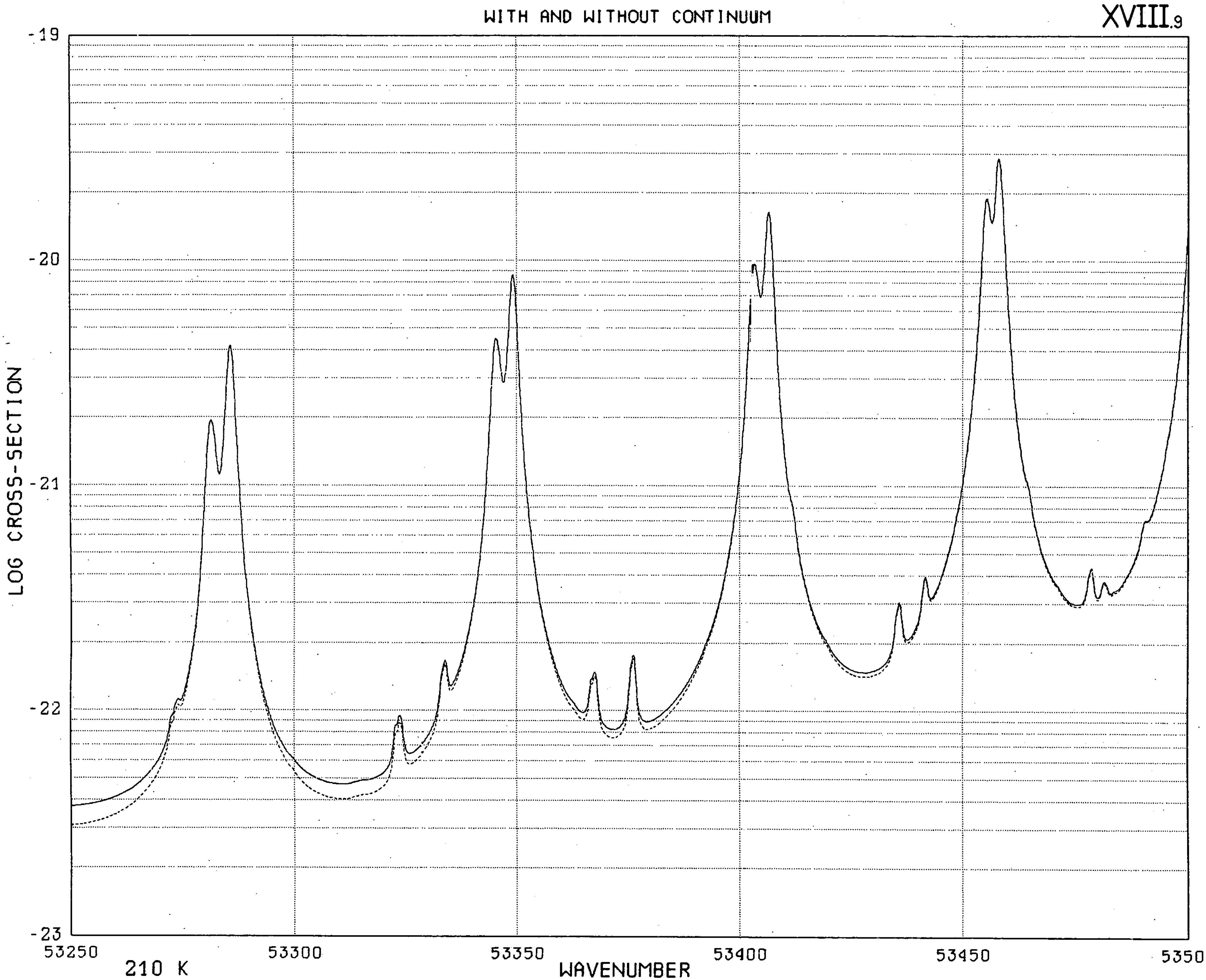


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53250
53300
53350
53400
53450
53500
300 K
WAVENUMBER

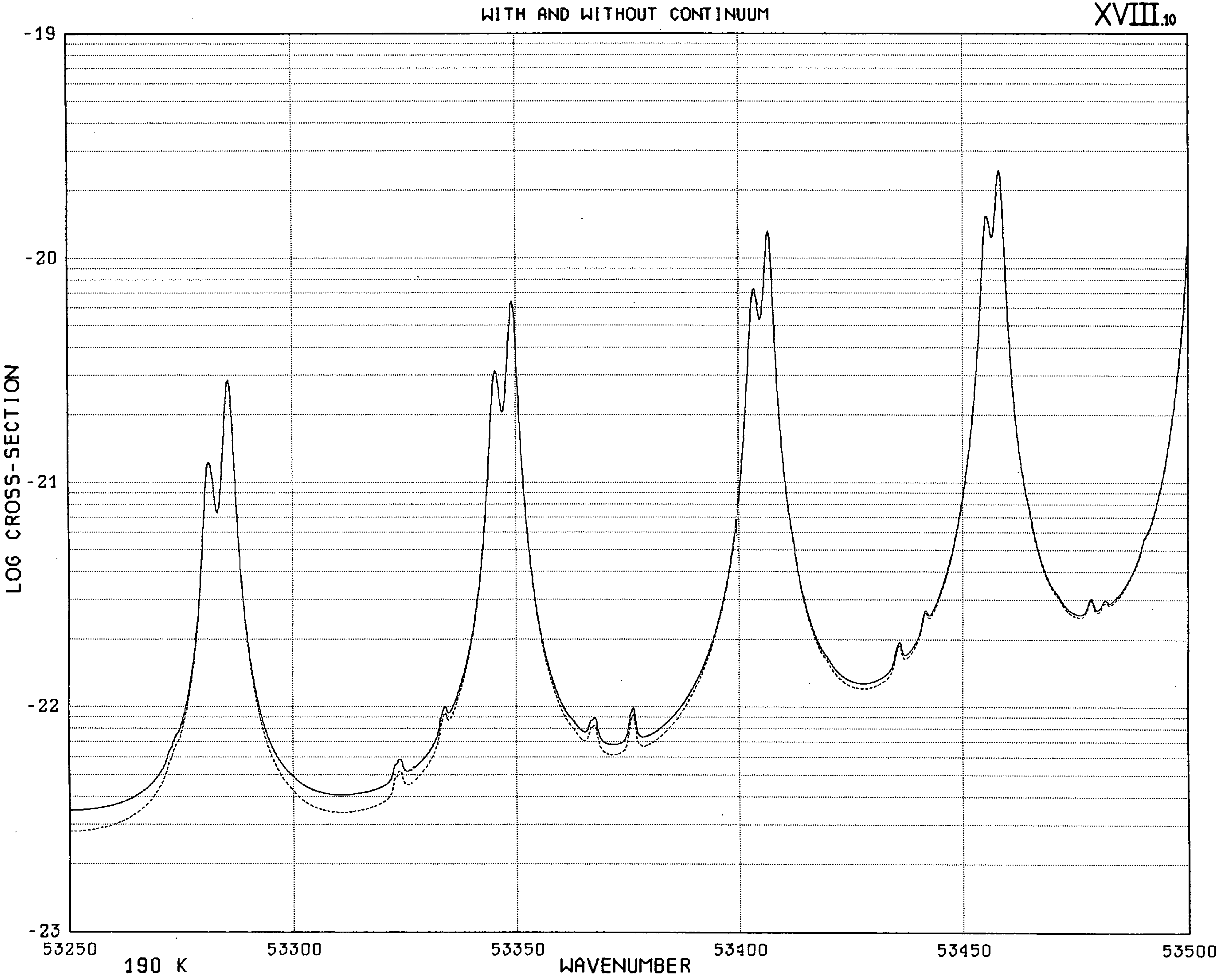

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53250
53300
53350
53400
53450
53500
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53250
53300
53350
53400
53450
53500
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53250
53300
53350
53400
53450
53500
230 K
WAVENUMBER



WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53250
53300
53350
53400
53450
53500
WAVENUMBER
210 K

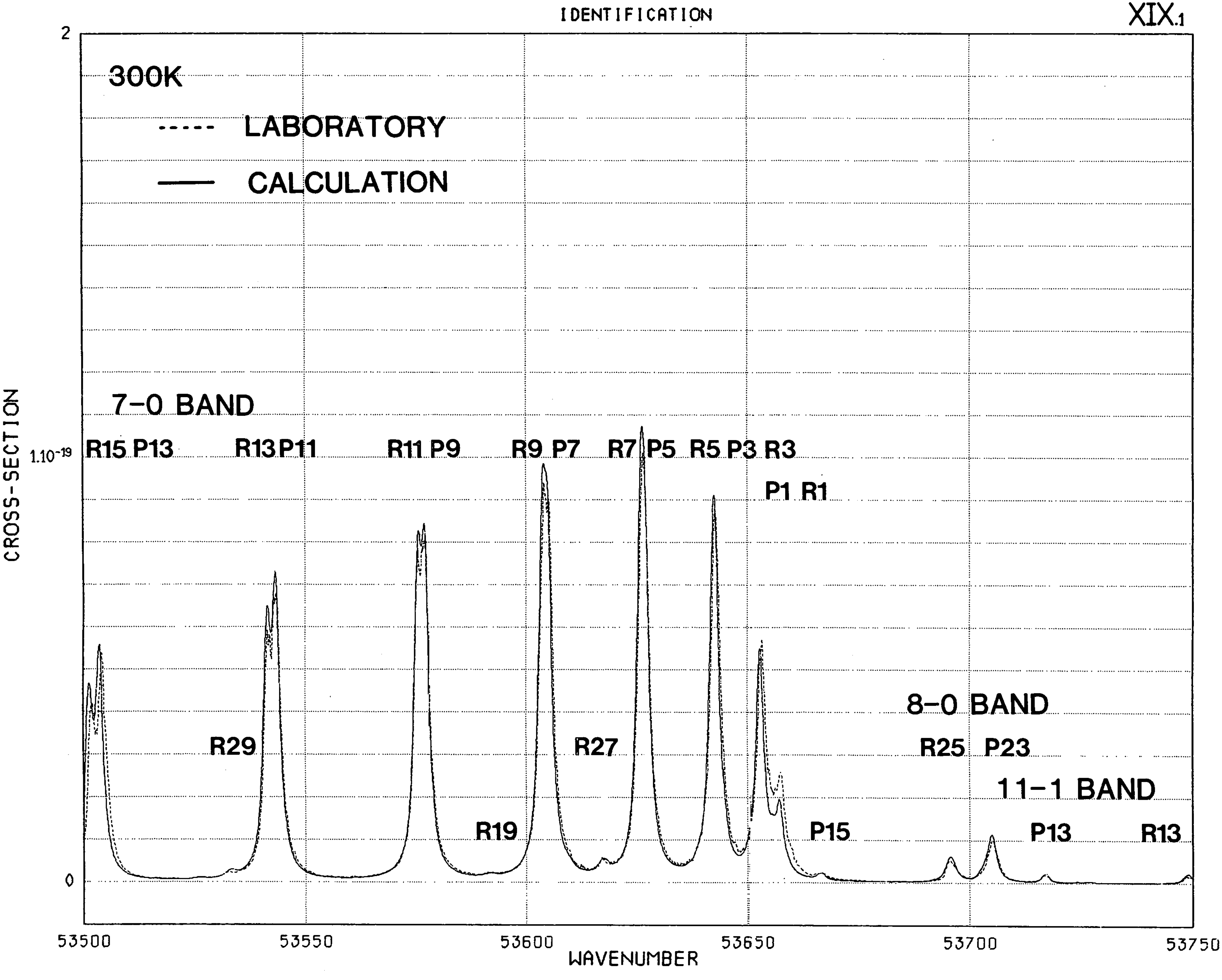

WITH AND WITHOUT CONTINUUM
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53250
53300
53350
53400
53450
53500
190 K
WAVENUMBER

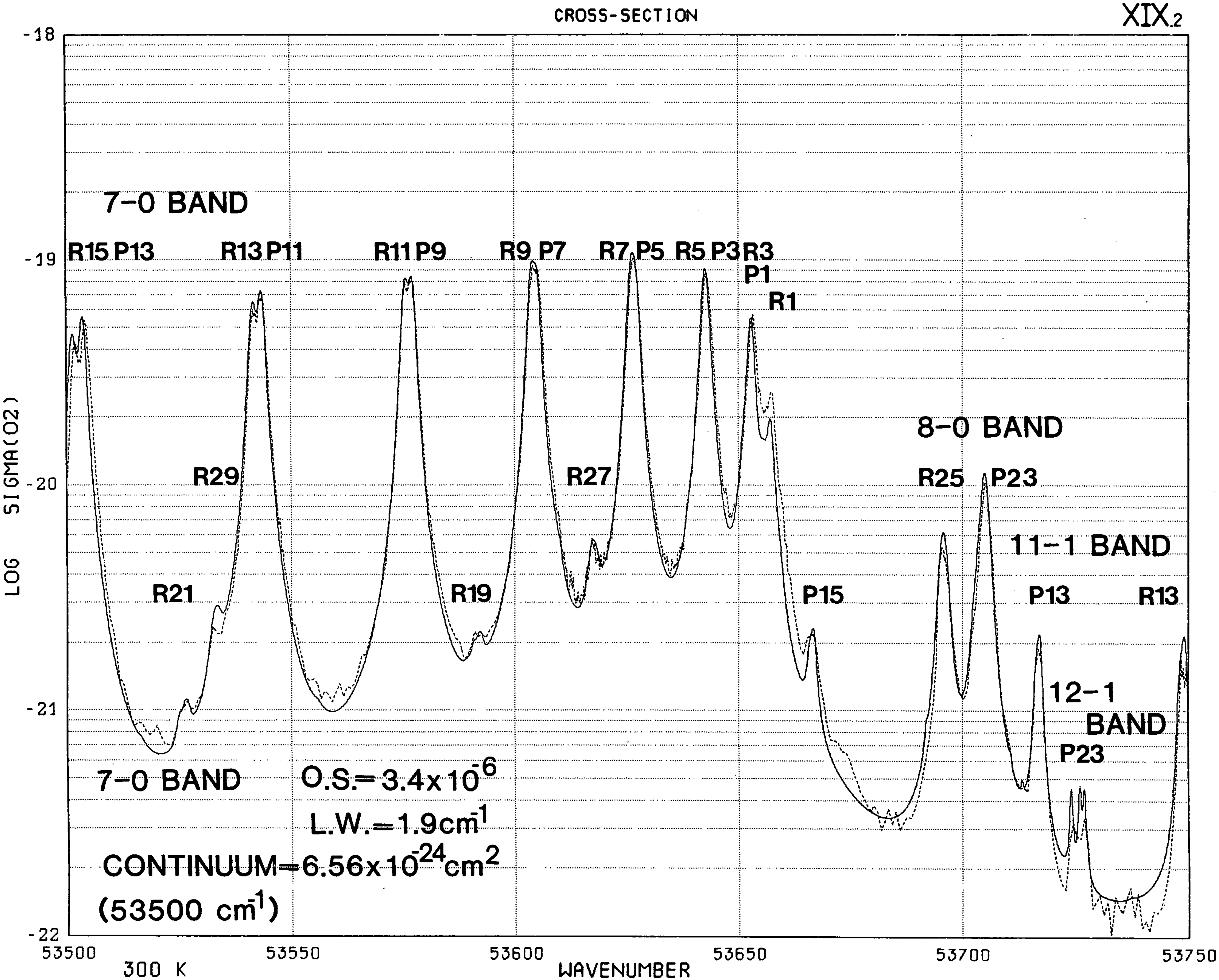
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
53500 - 53750 cm^{-1}

v	λ	band
53500		
53501.0	1869.12	7-0 R15
53501.2	1869.12	7-0 R15
53501.7	1869.10	7-0 R15
53503.4	1869.04	12-1 R29
53503.5	1869.04	7-0 P13
53503.6	1869.03	7-0 P13
53504.0	1869.02	7-0 P13
53506.3	1868.94	12-1 R29
53508.4	1868.87	12-1 R29
53524.9	1868.29	11-1 R21
53526.1	1868.25	11-1 R21
53526.8	1868.22	11-1 R21
53532.3	1868.03	8-0 R29
53533.0	1868.01	8-0 R29
53533.8	1867.98	8-0 R29
53541.1	1867.72	7-0 R13
53541.3	1867.72	7-0 R13
53541.7	1867.70	7-0 R13
53542.0	1867.69	12-1 P27
53543.3	1867.65	7-0 P11
53543.3	1867.65	7-0 P11
53543.6	1867.64	7-0 P11
53543.7	1867.63	8-0 P27
53544.1	1867.62	8-0 P27
53544.6	1867.60	8-0 P27
53545.1	1867.59	11-1 P19
53545.8	1867.56	12-1 P27
53546.0	1867.55	11-1 P19
53546.5	1867.54	11-1 P19
53550		
53575.3	1866.53	7-0 R11
53575.4	1866.53	7-0 R11
53575.8	1866.51	7-0 R11
53577.0	1866.47	7-0 P 9
53577.0	1866.47	7-0 P 9
53577.4	1866.46	7-0 P 9
53590.8	1865.99	11-1 R19
53591.9	1865.96	11-1 R19
53592.5	1865.93	11-1 R19
53600		
53601.3	1865.63	12-1 R27
53603.5	1865.55	7-0 R 9
53603.6	1865.55	7-0 R 9
53604.0	1865.53	7-0 R 9
53604.9	1865.50	7-0 P 7
53604.9	1865.50	7-0 P 7

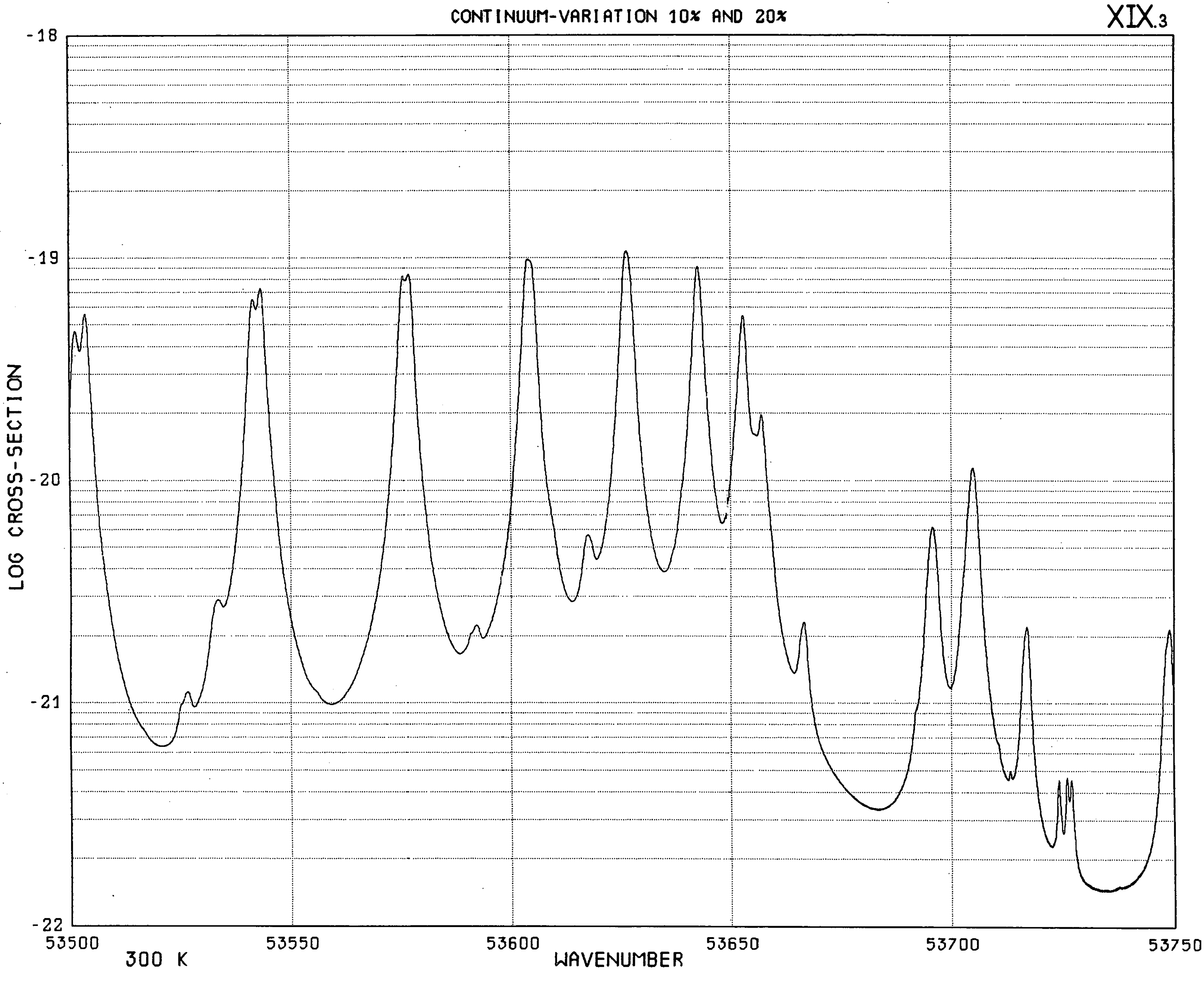
v	λ	band
53605.2	1865.49	7-0 P 7
53605.7	1865.47	12-1 R27
53608.9	1865.36	11-1 P17
53609.7	1865.34	11-1 P17
53610.1	1865.32	11-1 P17
53616.9	1865.09	8-0 R27
53617.5	1865.06	8-0 R27
53618.2	1865.04	8-0 R27
53625.9	1864.77	7-0 R 7
53625.9	1864.77	7-0 R 7
53626.3	1864.76	7-0 R 7
53626.8	1864.74	7-0 P 5
53626.9	1864.74	7-0 P 5
53627.2	1864.73	7-0 P 5
53627.2	1864.73	8-0 P25
53627.6	1864.71	8-0 P25
53628.1	1864.69	8-0 P25
53636.7	1864.40	12-1 P25
53638.8	1864.32	12-1 P25
53640.0	1864.28	12-1 P25
53642.2	1864.20	7-0 R 5
53642.3	1864.20	7-0 R 5
53642.6	1864.19	7-0 R 5
53642.9	1864.18	7-0 P 3
53642.9	1864.18	7-0 P 3
53643.4	1864.16	7-0 P 3
53650.0	1863.93	11-1 R17
53650		
53651.0	1863.90	11-1 R17
53651.5	1863.88	11-1 R17
53652.7	1863.84	7-0 R 3
53652.7	1863.84	7-0 R 3
53653.0	1863.83	7-0 P 1
53653.1	1863.82	7-0 R 3
53655.7	1863.74	7-0 Q 1
53657.2	1863.68	7-0 R 1
53657.3	1863.68	7-0 R 1
53666.0	1863.38	11-1 P15
53666.7	1863.35	11-1 P15
53667.0	1863.34	11-1 P15
53691.9	1862.48	12-1 R25
53694.3	1862.39	12-1 R25
53695.2	1862.36	8-0 R25
53695.8	1862.35	8-0 R25
53695.9	1862.34	12-1 R25

v	λ	band
53700		
53702.5	1862.11	11-1 R15
53703.3	1862.08	11-1 R15
53703.8	1862.07	11-1 R15
53704.6	1862.04	8-0 P23
53705.0	1862.02	8-0 P23
53705.4	1862.01	8-0 P23
53706.9	1861.96	13-1 P29
53710.7	1861.83	13-1 P29
53713.3	1861.74	13-1 P29
53716.4	1861.63	11-1 P13
53717.1	1861.61	11-1 P13
53717.4	1861.60	11-1 P13
53724.2	1861.36	12-1 P23
53726.1	1861.29	12-1 P23
53727.1	1861.26	12-1 P23
53748.3	1860.52	11-1 R13
53749.0	1860.50	11-1 R13
53749.4	1860.49	11-1 R13

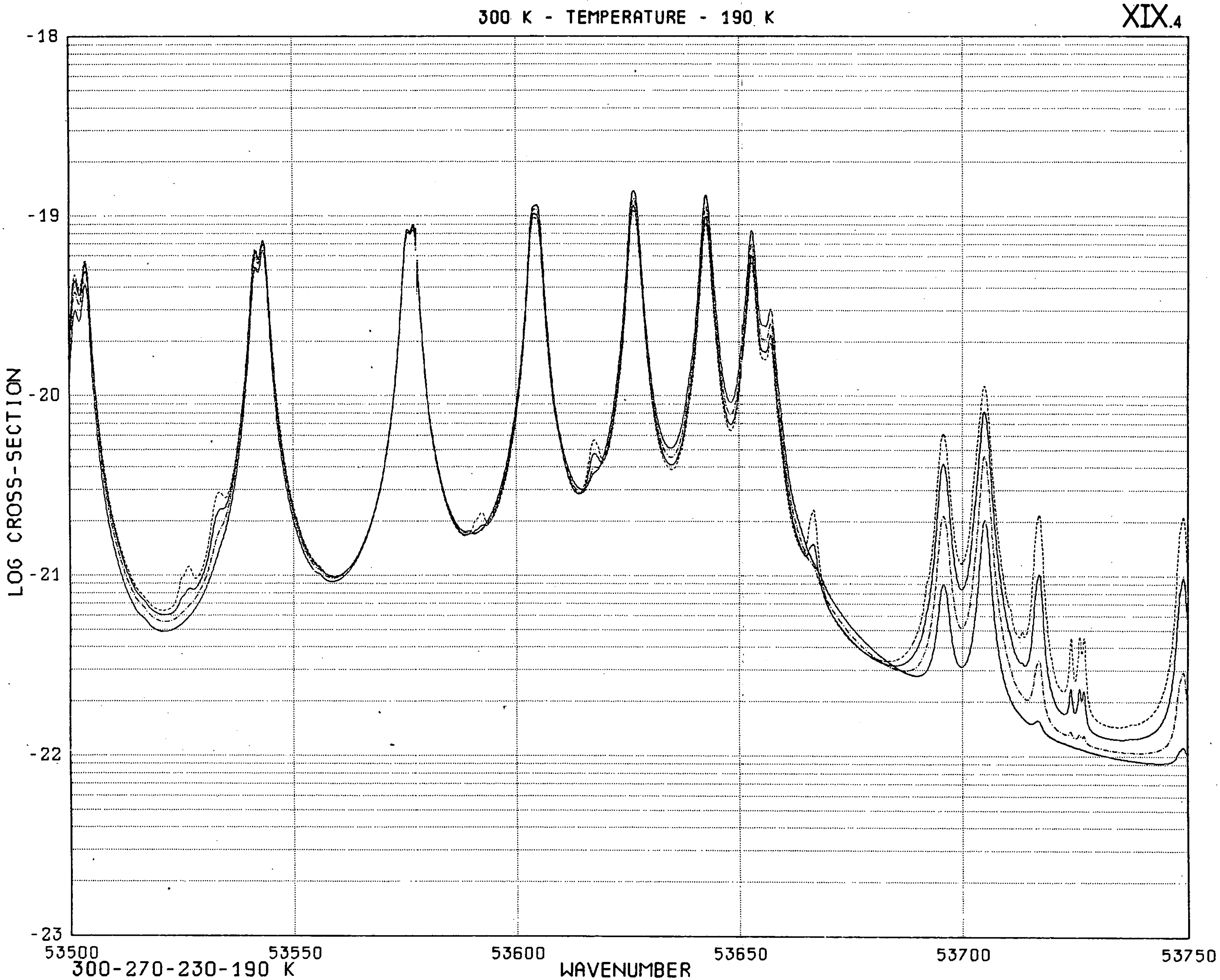

IDENTIFICATION
300K
LABORATORY
CALCULATION
7-0 BAND
R15 P13
R13 P11
R11 P9
R9 P7
R7 P5
R5 P3 R3
P1 R1
R29
R19
R27
P15
8-0 BAND
R25 P23
11-1 BAND
P13
R13
CROSS-SECTION
2
1.10-19
0
53500
53550
53600
53650
53700
53750
WAVENUMBER



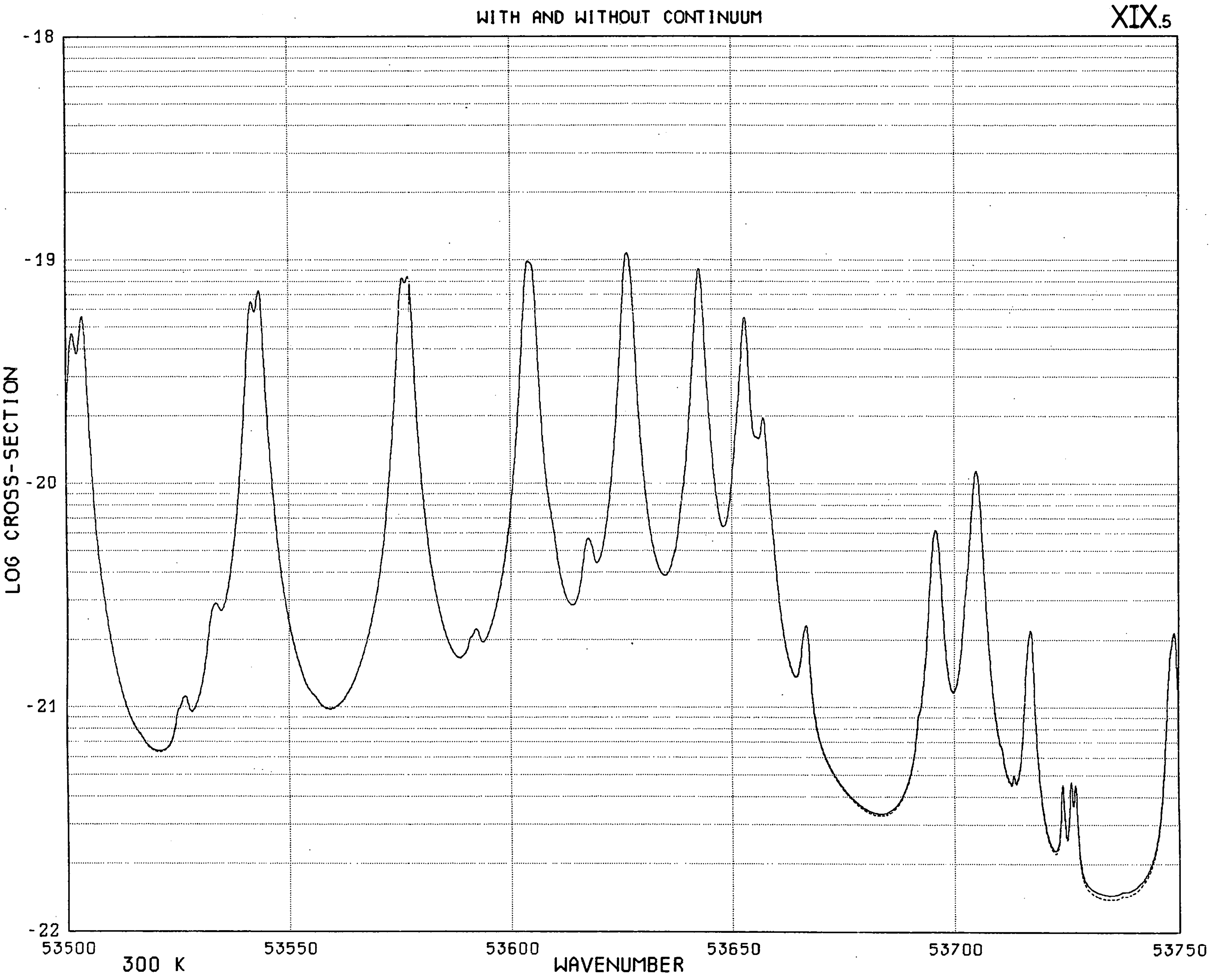
CROSS-SECTION
LOG SIGMA(O2)
-18
-19
-20
-21
-22
7-0 BAND
R15 P13
R13 P11
R11 P9
R9 P7
R7 P5
R5 P3 R3
P1
R1
R29
R27
R21
R19
8-0 BAND
R25
P23
11-1 BAND
P15
P13
R13
12-1
BAND
P23
7-0 BAND
O.S.=3.4x10-6
L.W.=1.9cm-1
CONTINUUM=6.56x10-24cm2
(53500 cm-1)
53500
53550
53600
53650
53700
53750
300 K
WAVENUMBER



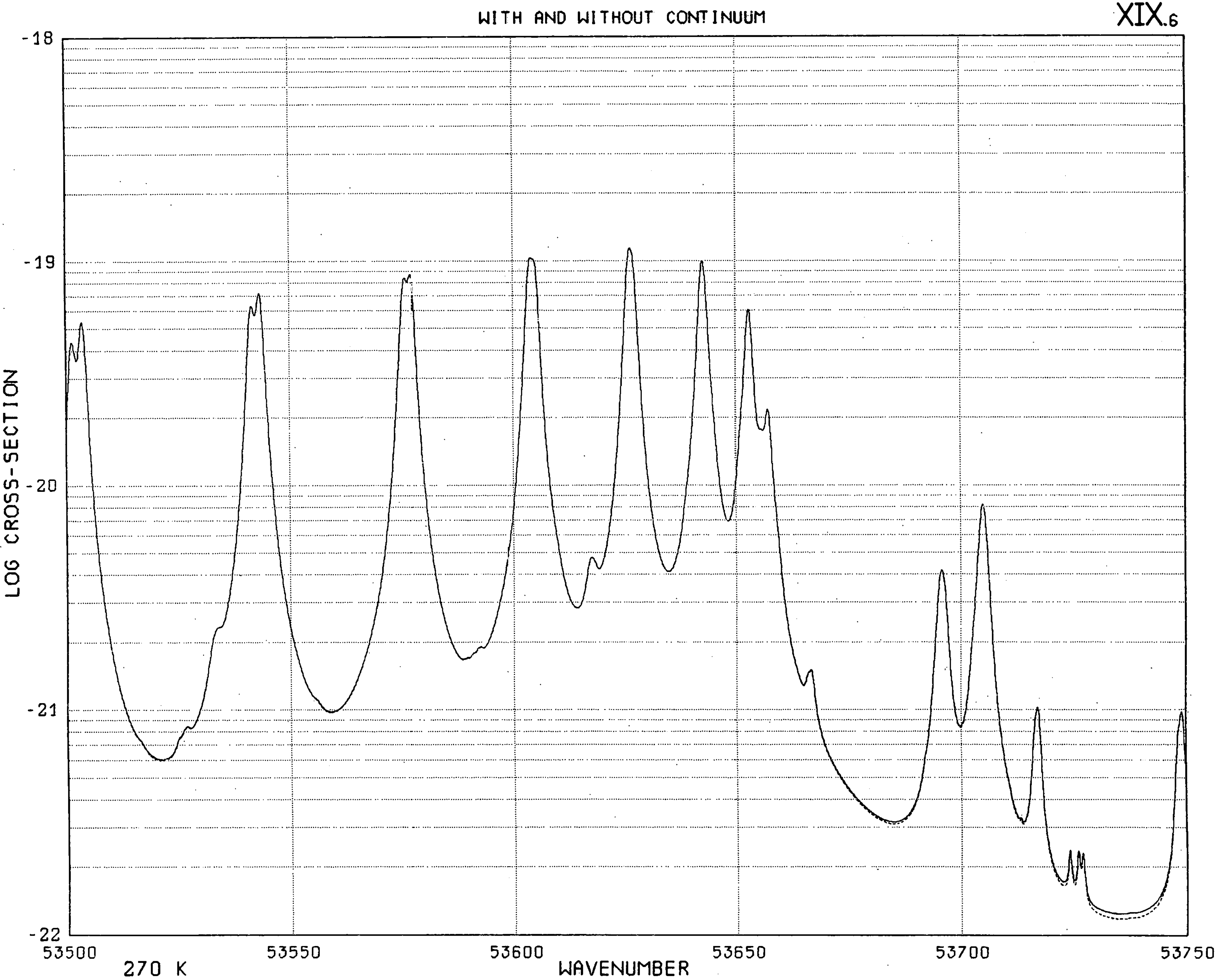
CONTINUUM-VARIATION 10% AND 20%
-18
-19
-20
-21
-22
LOG CROSS-SECTION
53500
53550
53600
53650
53700
53750
300 K
WAVENUMBER

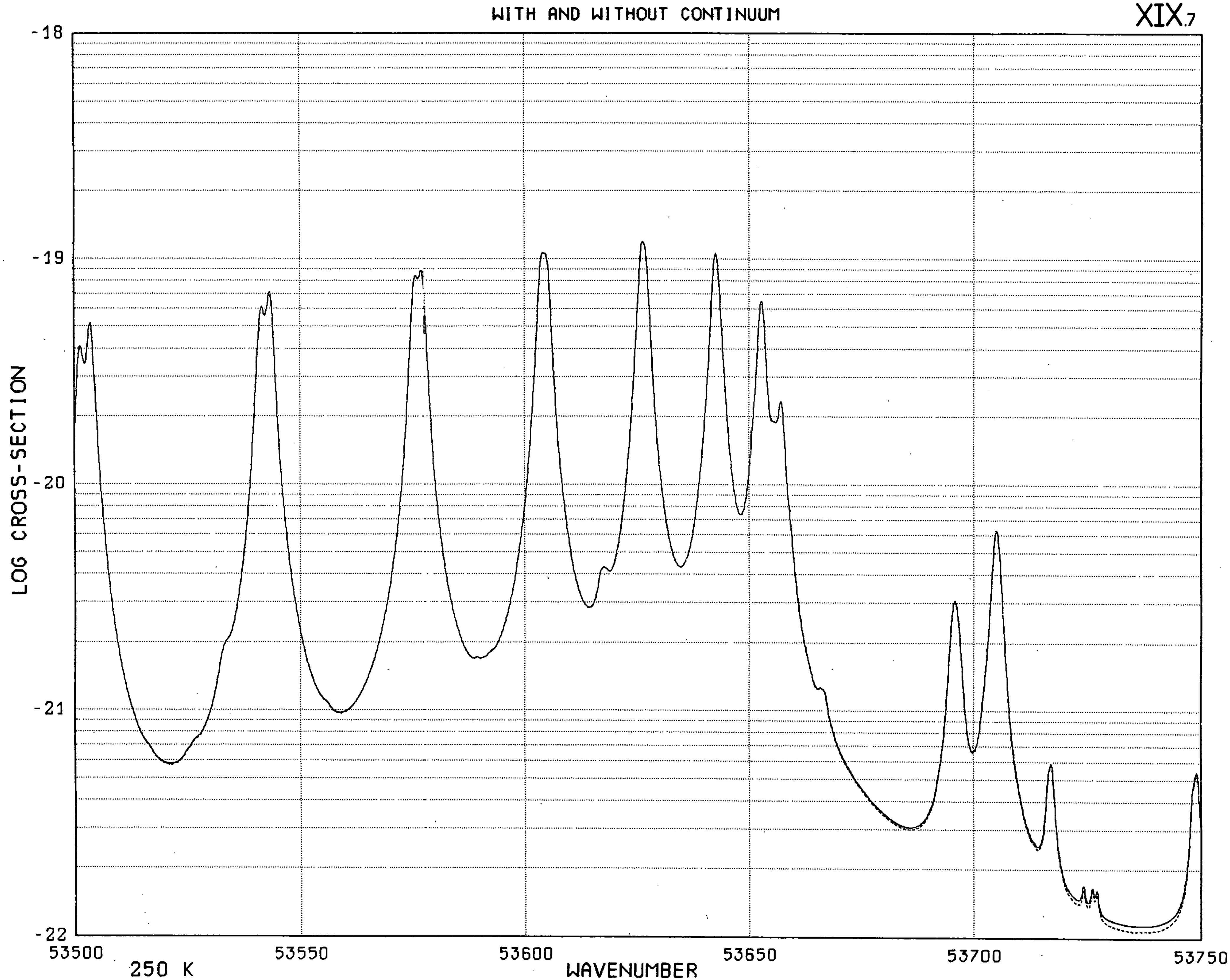

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-18
-19
-20
-21
-22
-23
53500
53550
53600
53650
53700
53750
WAVENUMBER
300-270-230-190 K

XIX.5

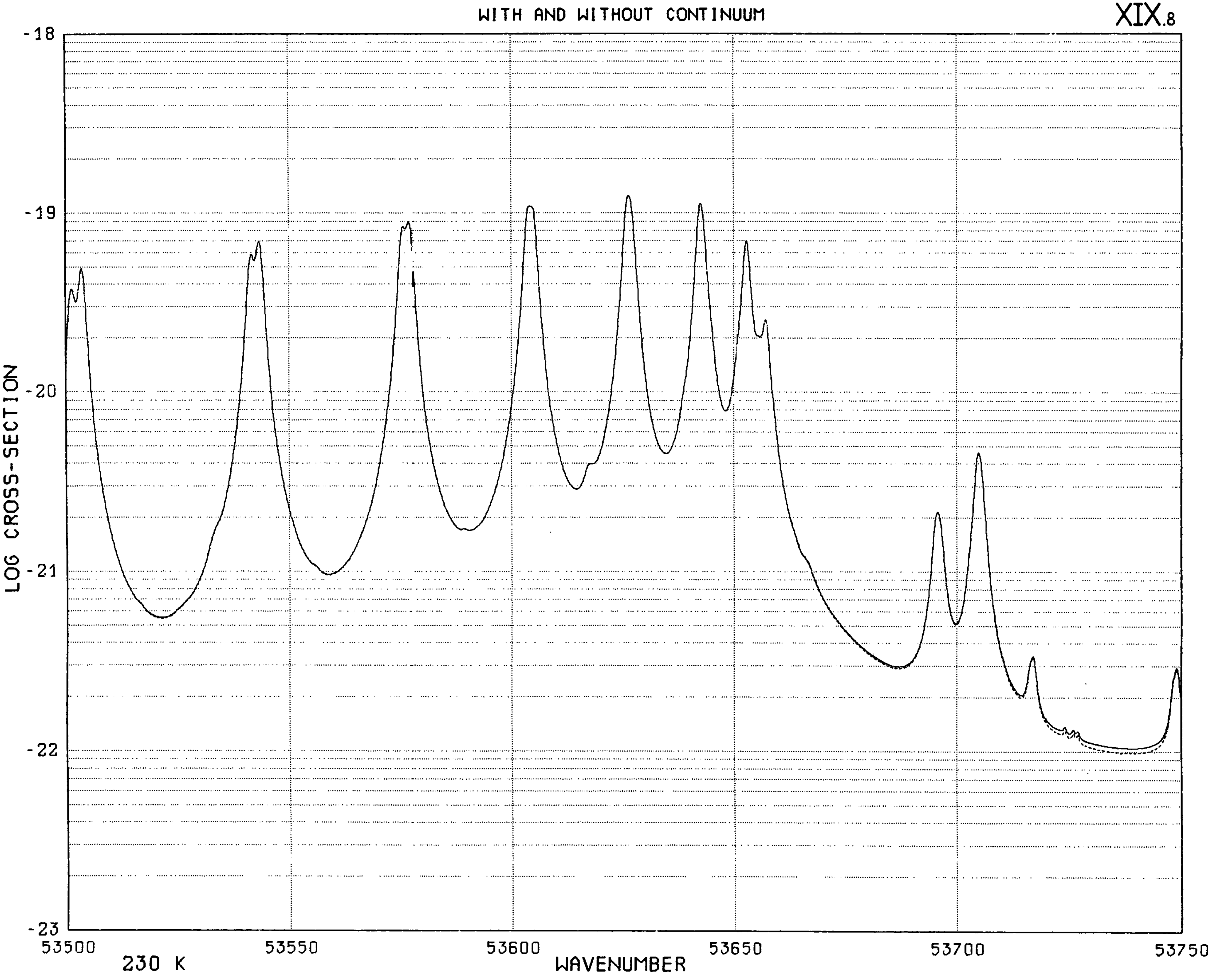


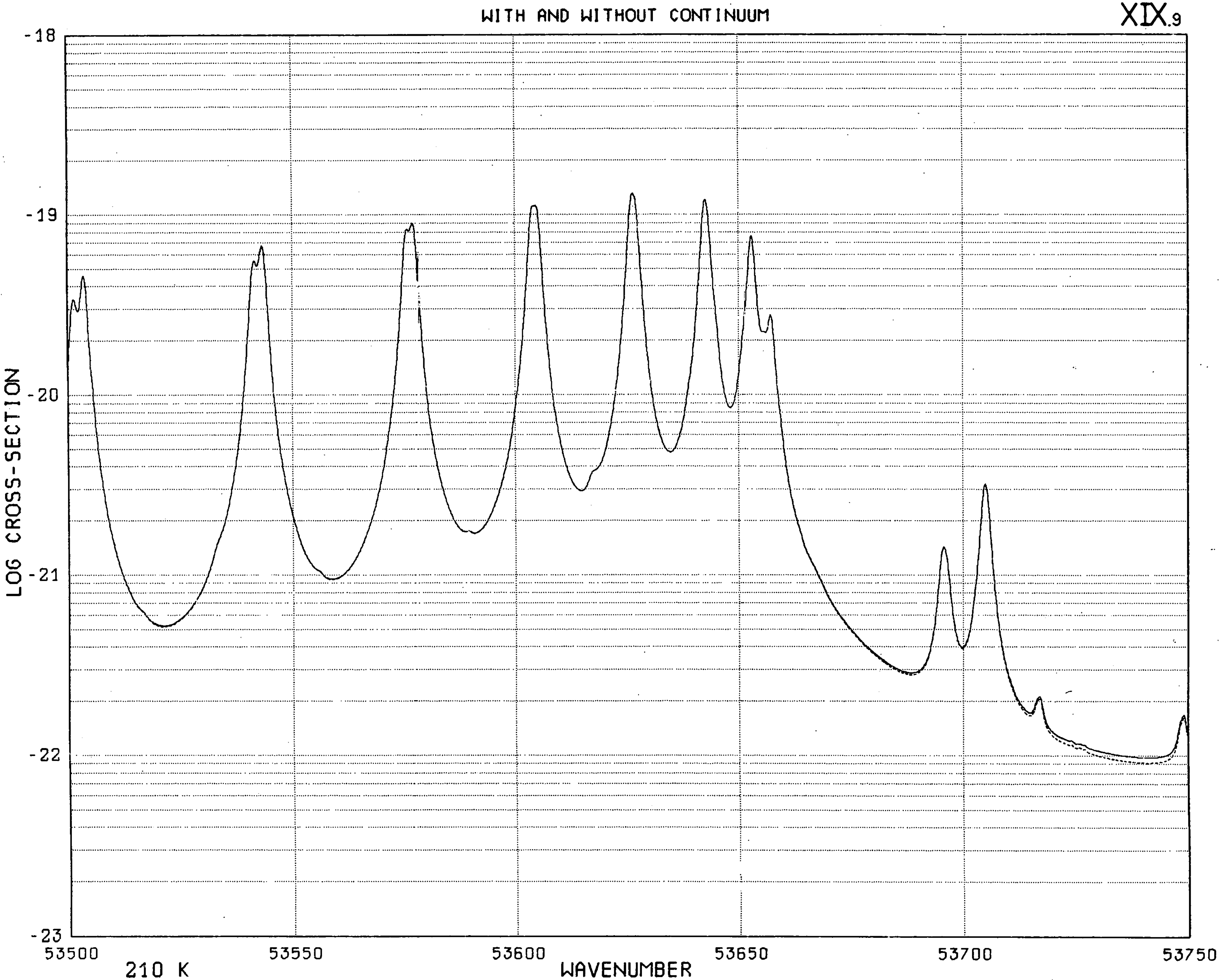
WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
53500
53550
53600
53650
53700
53750
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
53500
53550
53600
53650
53700
53750
270 K
WAVENUMBER

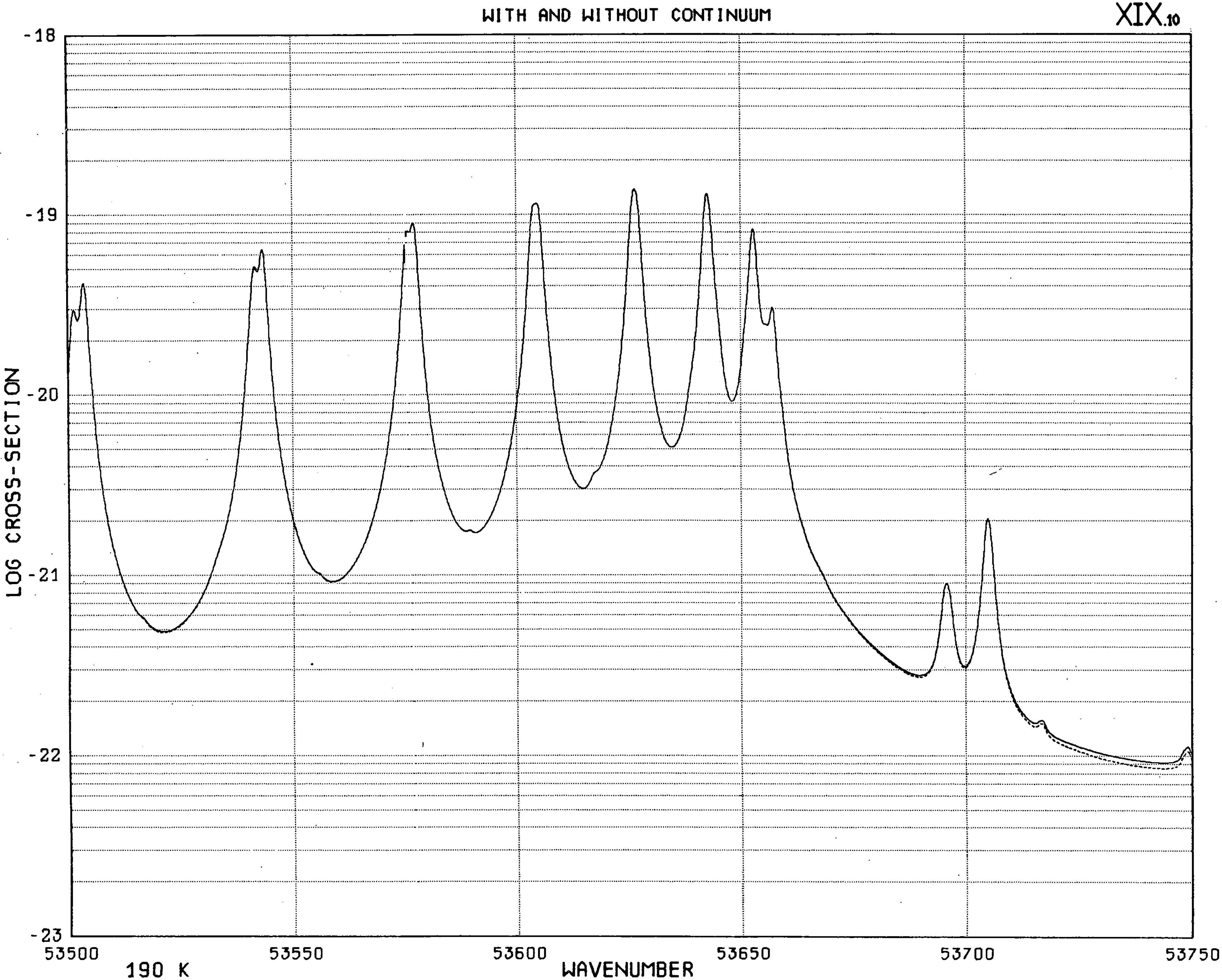


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
53500
53550
53600
53650
53700
53750
WAVENUMBER
250 K


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
-23
53500
53550
53600
53650
53700
53750
230 K
WAVENUMBER

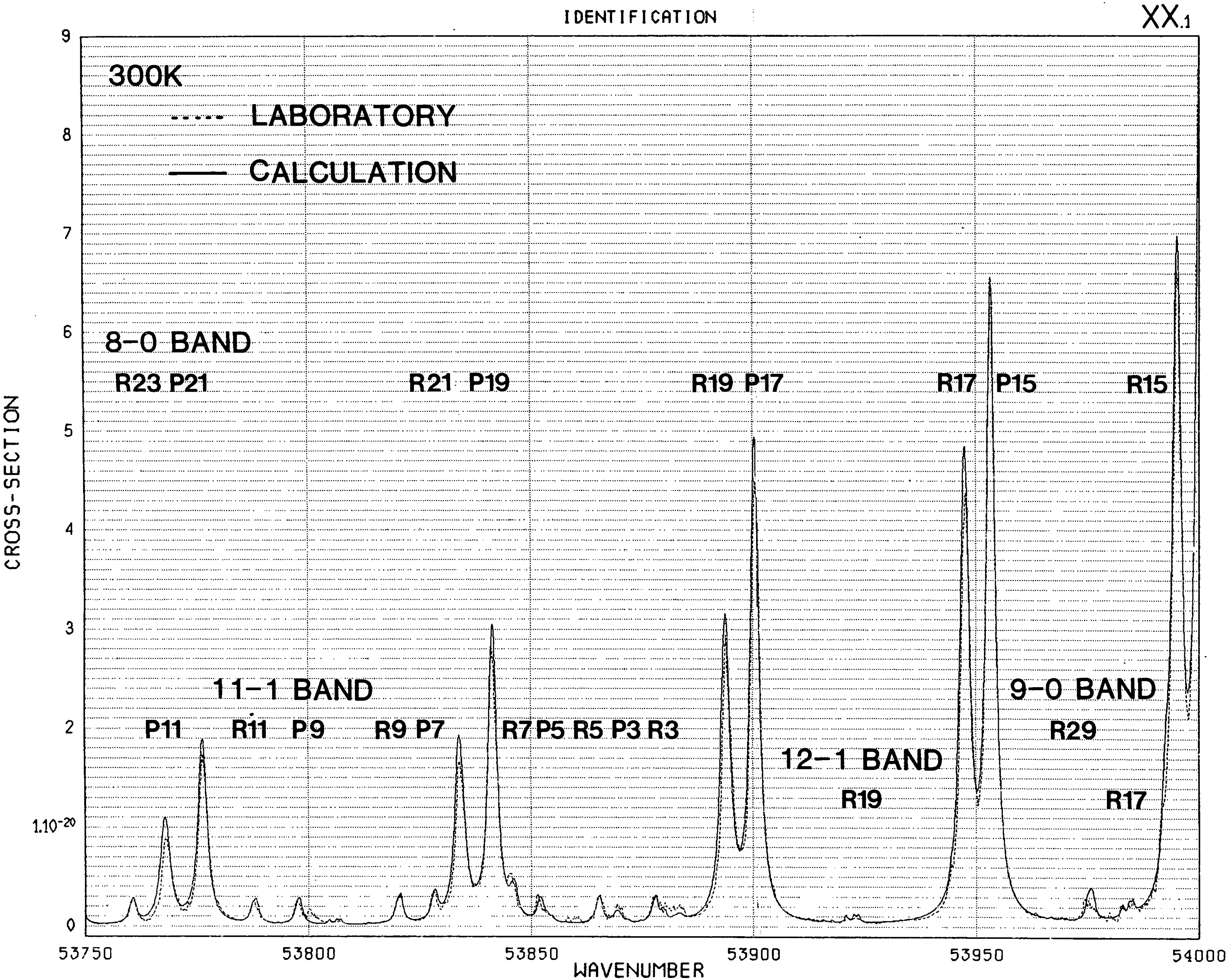


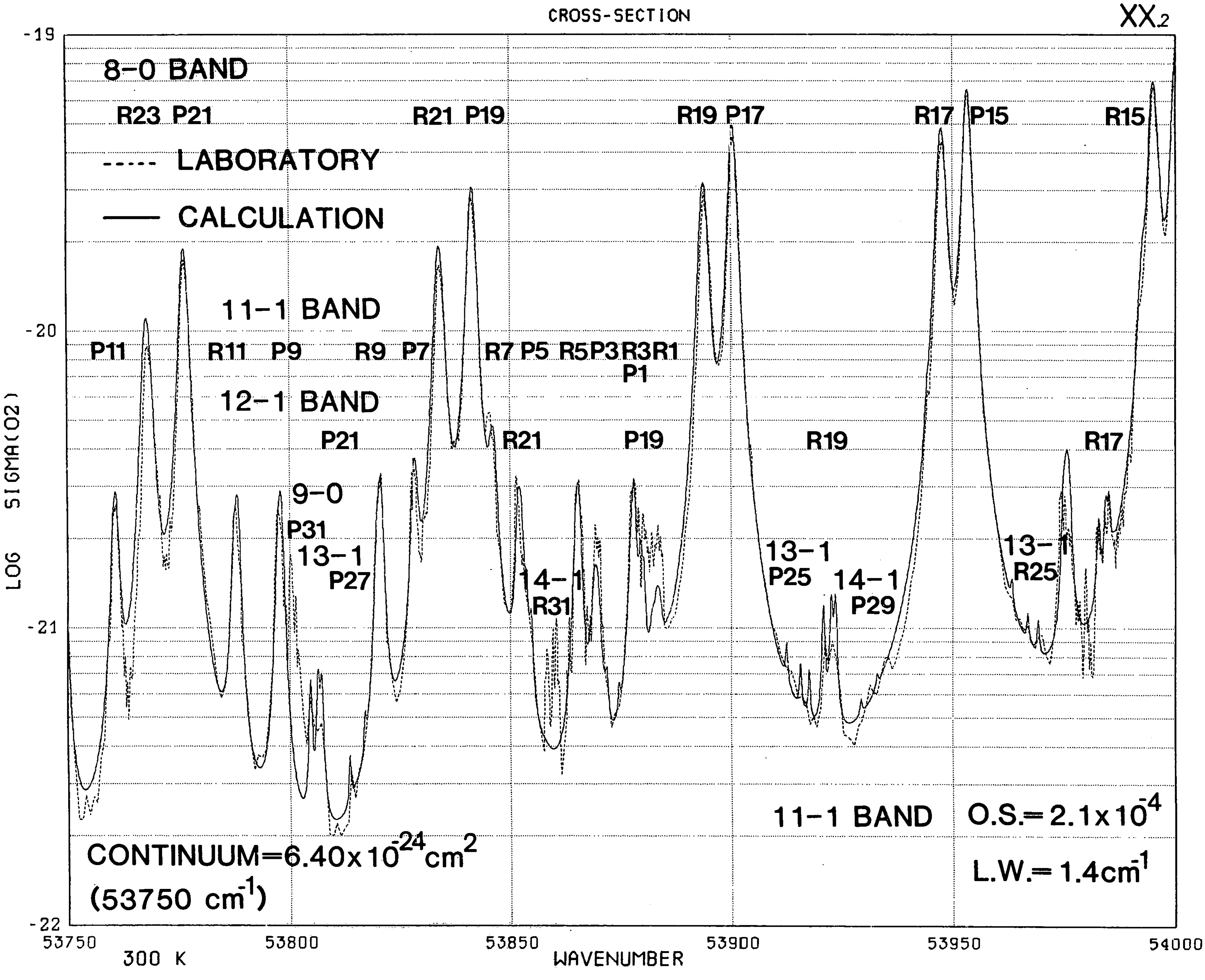
WITH AND WITHOUT CONTINUUM
XIX.9
LOG CROSS-SECTION
-18
-19
-20
-21
-22
-23
53500
53550
53600
53650
53700
53750
210 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
-23
LOG CROSS-SECTION
53500
53550
53600
53650
53700
53750
WAVENUMBER
190 K

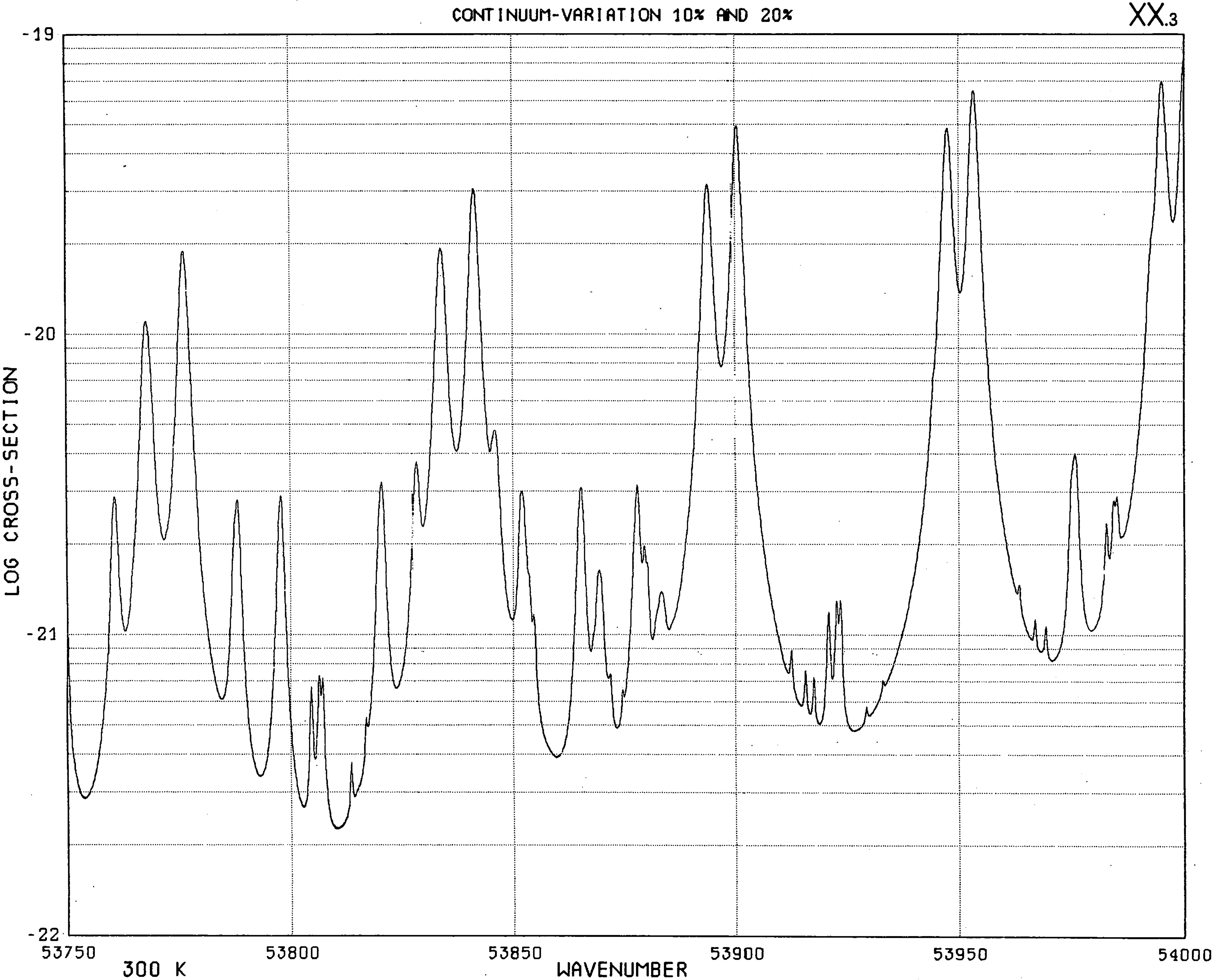
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
53750 - 54000 cm^{-1}

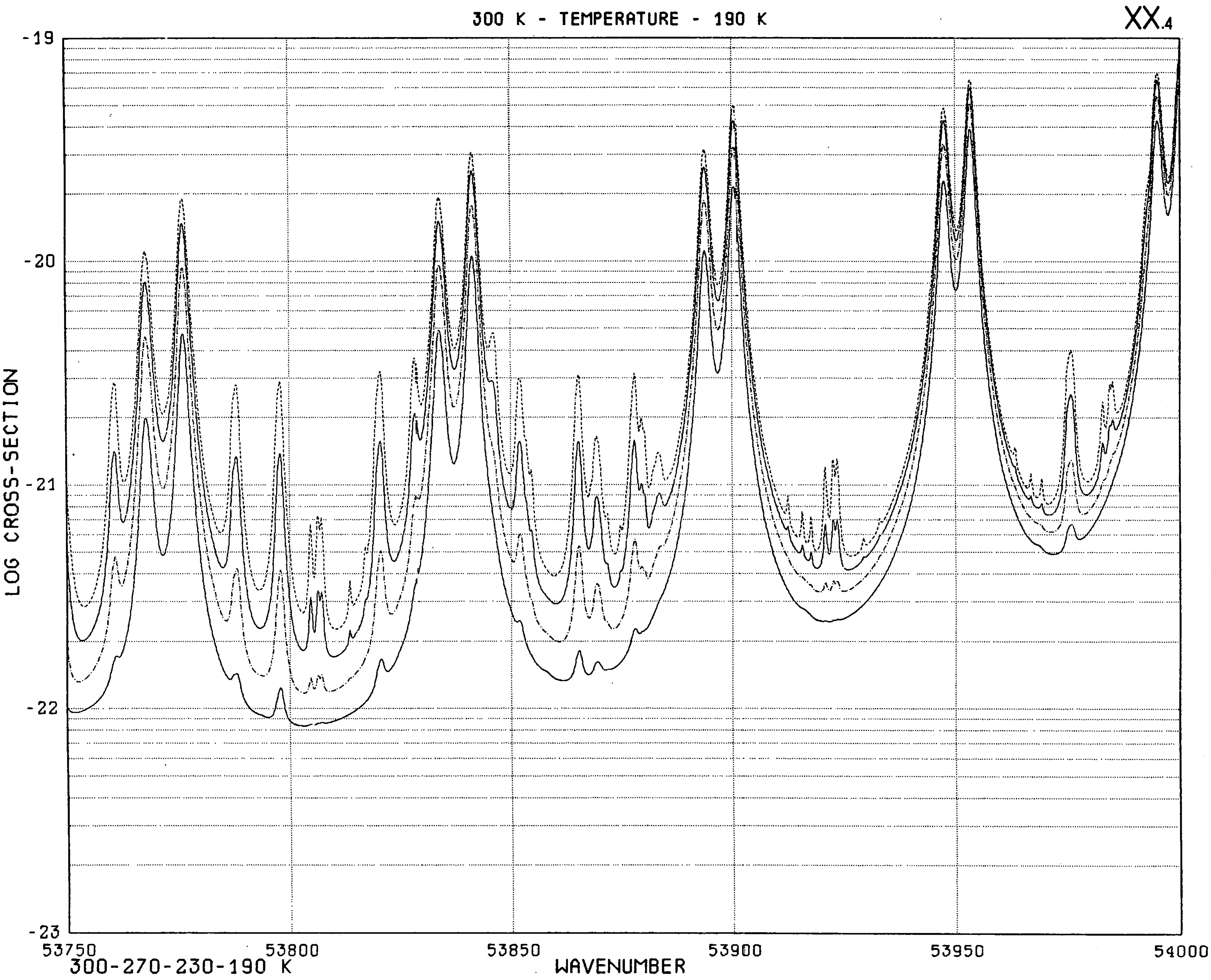
ν	λ	band	ν	λ	band	ν	λ	band
53750						53950		
53760.2	1860.11	11-1 P11	53852.3	1856.93	11-1 P 5	53953.1	1853.46	8-0 P15
53760.8	1860.09	11-1 P11	53852.5	1856.92	11-1 P 5	53953.3	1853.45	8-0 P15
53761.0	1860.08	11-1 P11	53853.6	1856.88	12-1 R21	53953.7	1853.44	8-0 P15
53764.9	1859.95	13-1 R29	53854.7	1856.85	12-1 R21	53963.4	1853.11	13-1 R25
53767.4	1859.86	8-0 R23	53864.8	1856.50	11-1 R 5	53967.0	1852.99	13-1 R25
53767.9	1859.85	8-0 R23	53865.4	1856.48	11-1 R 5	53969.3	1852.90	13-1 R25
53768.5	1859.82	8-0 R23	53865.6	1856.47	11-1 R 5	53975.1	1852.71	9-0 R29
53769.2	1859.80	13-1 R29	53868.0	1856.39	13-1 R27	53975.8	1852.68	9-0 R29
53772.3	1859.69	13-1 R29	53869.0	1856.36	11-1 P 3	53975.9	1852.68	14-1 R29
53775.4	1859.59	12-1 R23	53869.5	1856.34	11-1 P 3	53976.4	1852.66	9-0 R29
53775.9	1859.57	8-0 P21	53870.0	1856.32	11-1 P 3	53982.1	1852.47	14-1 R29
53776.2	1859.56	8-0 P21	53871.9	1856.26	13-1 R27	53982.9	1852.44	12-1 R17
53776.6	1859.54	8-0 P21	53874.6	1856.16	13-1 R27	53984.5	1852.38	12-1 R17
53777.5	1859.51	12-1 R23	53877.3	1856.07	11-1 R 3	53985.3	1852.36	12-1 R17
53778.9	1859.47	12-1 R23	53877.9	1856.05	11-1 R 3	53986.4	1852.32	14-1 R29
53787.4	1859.17	11-1 R11	53878.0	1856.04	12-1 P19	53992.1	1852.12	9-0 P27
53788.1	1859.15	11-1 R11	53878.2	1856.04	11-1 R 3	53992.6	1852.11	9-0 P27
53788.4	1859.14	11-1 R11	53879.4	1856.00	11-1 P 1	53993.0	1852.09	9-0 P27
53797.4	1858.83	11-1 P 9	53879.5	1855.99	12-1 P19	53994.8	1852.03	8-0 R15
53797.9	1858.81	11-1 P 9	53880.2	1855.97	12-1 P19	53995.1	1852.02	8-0 R15
53798.1	1858.80	11-1 P 9	53882.1	1855.90	11-1 Q 1	53995.5	1852.01	8-0 R15
53800			53883.1	1855.87	11-1 R 1			
53804.6	1858.58	12-1 P21	53883.8	1855.85	11-1 R 1			
53806.3	1858.52	12-1 P21	53893.4	1855.51	8-0 R19			
53807.2	1858.49	12-1 P21	53893.8	1855.50	8-0 R19			
53813.5	1858.27	13-1 P27	53894.3	1855.49	8-0 R19			
53817.0	1858.15	13-1 P27	53899.7	1855.30	9-0 P29			
53819.2	1858.07	13-1 P27	53900					
53819.8	1858.05	11-1 R 9	53900.2	1855.28	8-0 P17			
53820.5	1858.03	11-1 R 9	53900.2	1855.28	9-0 P29			
53820.8	1858.02	11-1 R 9	53900.6	1855.27	9-0 P29			
53827.9	1857.77	11-1 P 7	53912.5	1854.86	13-1 P25			
53828.4	1857.76	11-1 P 7	53915.6	1854.75	13-1 P25			
53828.6	1857.75	11-1 P 7	53917.6	1854.68	13-1 P25			
53833.5	1857.58	8-0 R21	53920.8	1854.57	12-1 R19			
53833.9	1857.57	8-0 R21	53922.6	1854.51	12-1 R19			
53834.5	1857.55	8-0 R21	53923.5	1854.48	12-1 R19			
53841.1	1857.32	8-0 P19	53923.8	1854.47	14-1 P29			
53841.4	1857.31	8-0 P19	53929.4	1854.28	14-1 P29			
53841.8	1857.29	8-0 P19	53933.0	1854.15	14-1 P29			
53845.6	1857.16	11-1 R 7	53944.3	1853.76	12-1 P17			
53846.2	1857.14	11-1 R 7	53945.7	1853.71	12-1 P17			
53846.5	1857.13	11-1 R 7	53946.3	1853.70	12-1 P17			
53850			53947.2	1853.66	8-0 R17			
53851.7	1856.95	12-1 R21	53947.5	1853.65	8-0 R17			
53851.8	1856.95	11-1 P 5	53948.0	1853.64	8-0 R17			


IDENTIFICATION
300K
LABORATORY
CALCULATION
8-0 BAND
R23 P21
R21 P19
R19 P17
R17 P15
R15
11-1 BAND
P11
R11 P9
R9 P7
R7 P5 R5 P3 R3
12-1 BAND
R19
9-0 BAND
R29
R17
CROSS-SECTION
1.10^{-20}
0
2
3
4
5
6
7
8
9
WAVENUMBER
53750
53800
53850
53900
53950
54000



XX2
CROSS-SECTION
8-0 BAND
R23 P21
R21 P19
R19 P17
R17 P15
R15
----- LABORATORY
—— CALCULATION
11-1 BAND
P11 R11 P9 R9 P7 R7 P5 R5 P3 R3 R1
P1
12-1 BAND
P21 R21 P19 R19 R17
9-0
P31
13-1
P27
14-1
R31
13-1
P25
14-1
P29
13-1
R25
11-1 BAND
O.S.= 2.1x10-4
L.W.= 1.4cm-1
CONTINUUM=6.40x10-24cm2
(53750 cm-1)
LOG SIGMA(O2)
-19
-20
-21
-22
53750
53800
53850
53900
53950
54000
300 K
WAVENUMBER

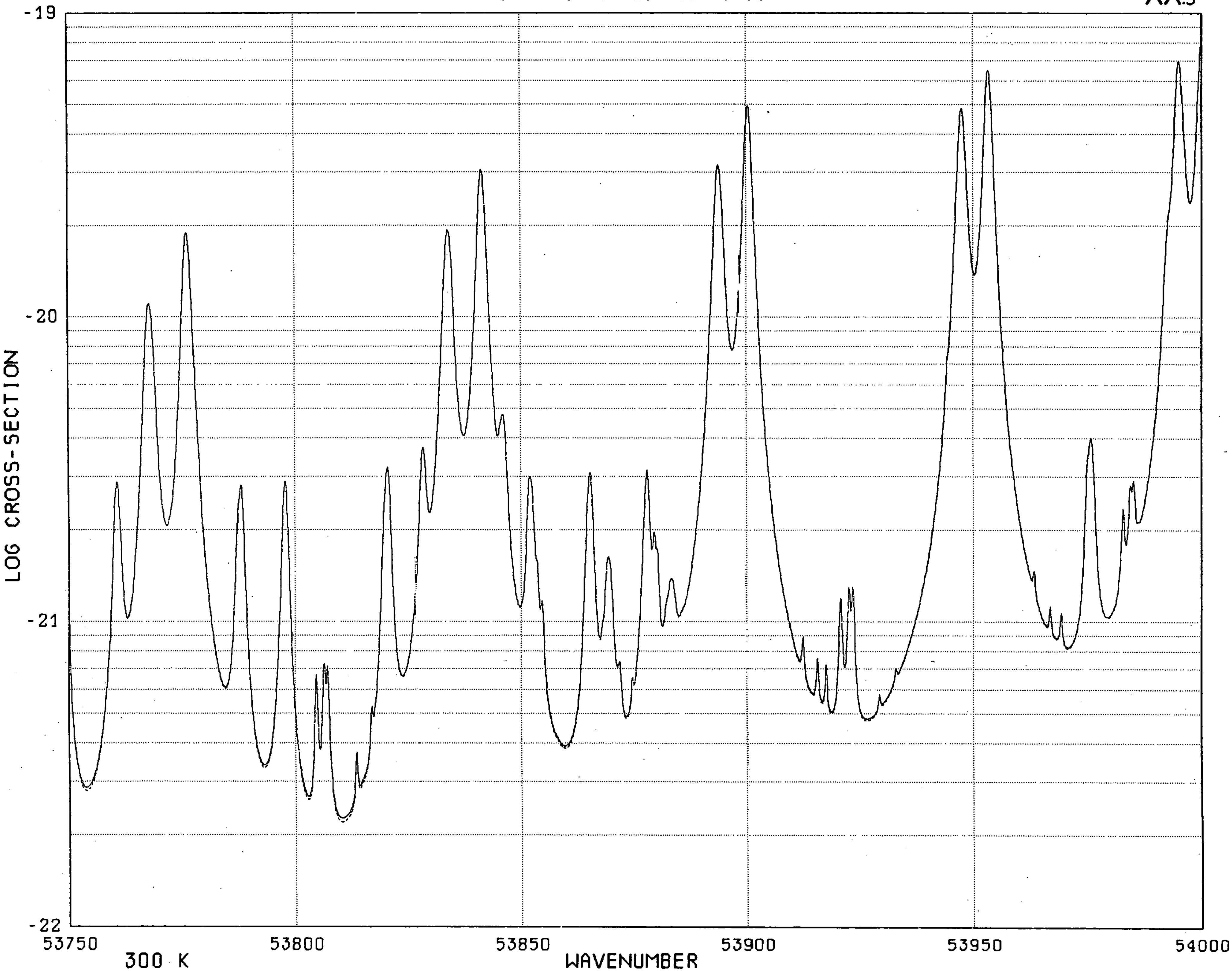

CONTINUUM-VARIATION 10% AND 20%
LOG CROSS-SECTION
-19
-20
-21
-22
53750
53800
53850
53900
53950
54000
300 K
WAVENUMBER

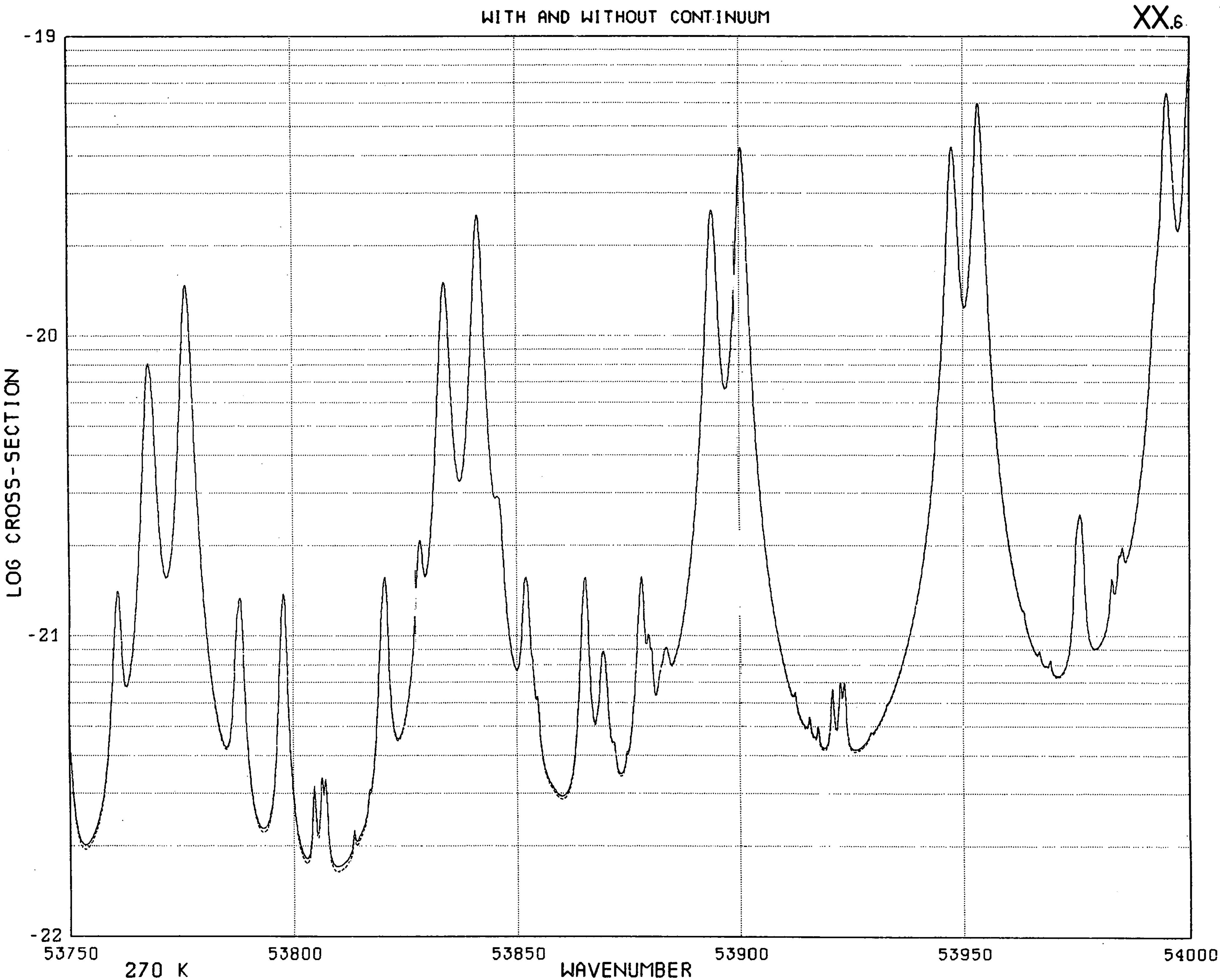


300 K - TEMPERATURE - 190 K
XX.4
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53750
53800
53850
53900
53950
54000
300-270-230-190 K
WAVENUMBER

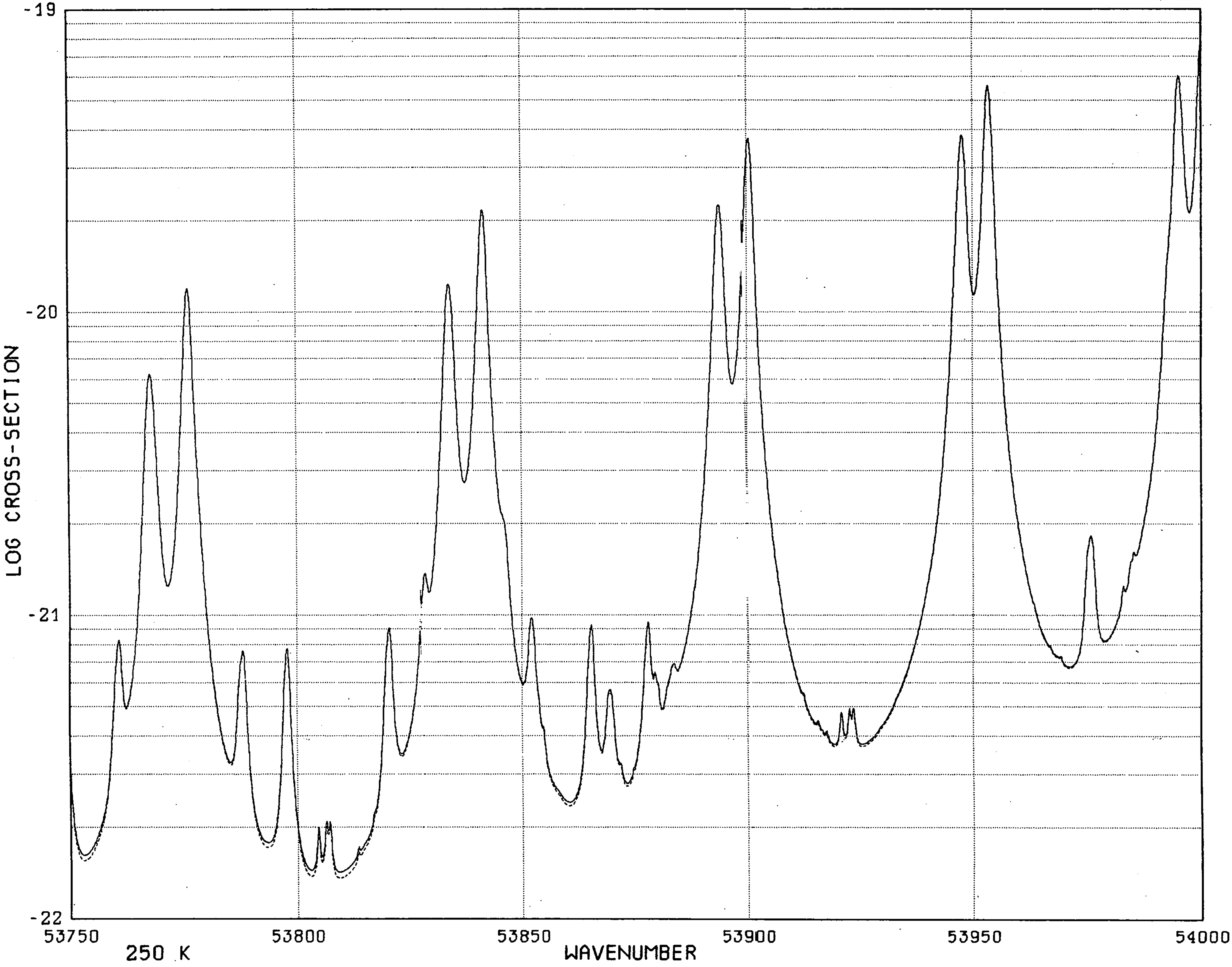
XX.5

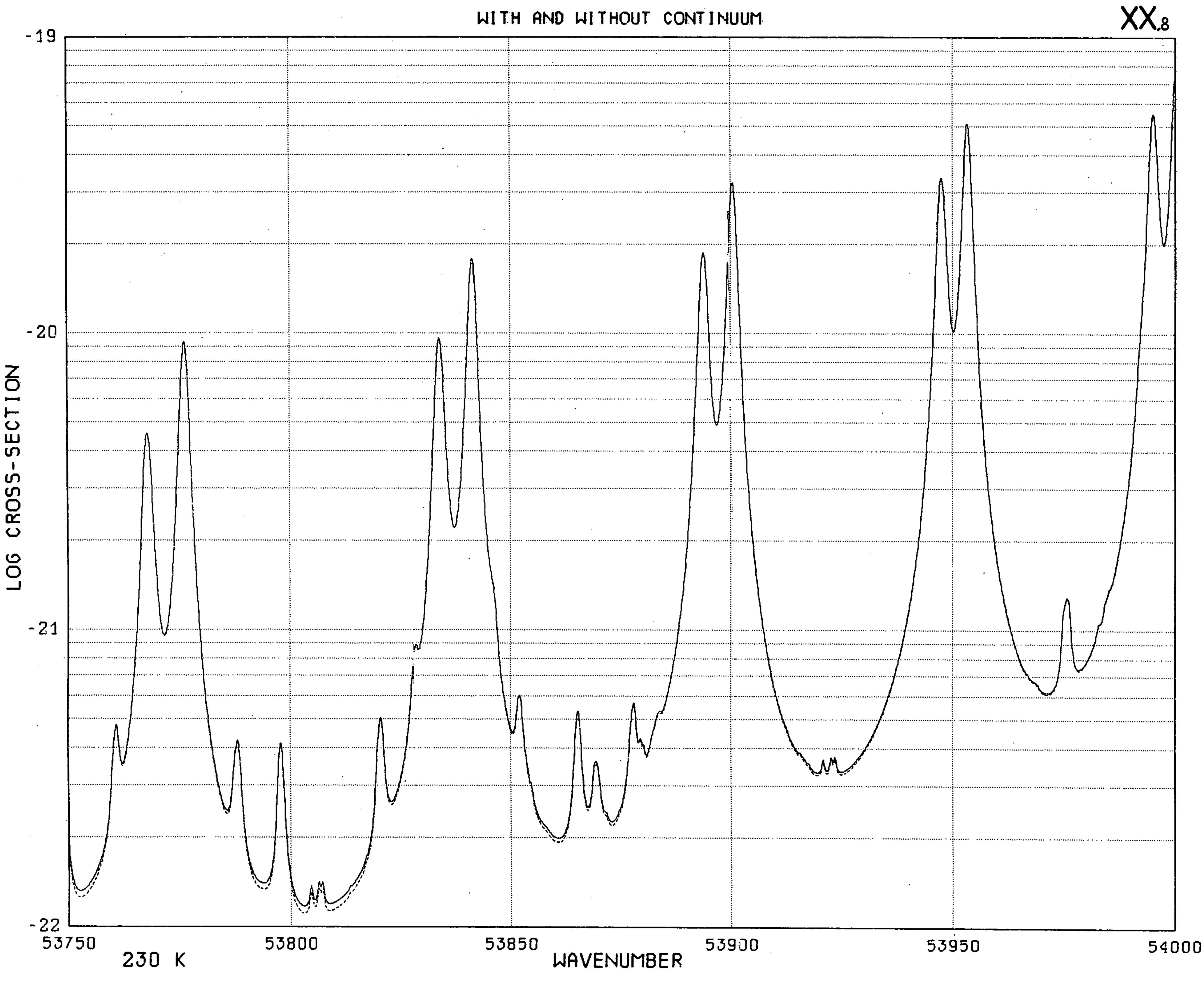
WITH AND WITHOUT CONTINUUM



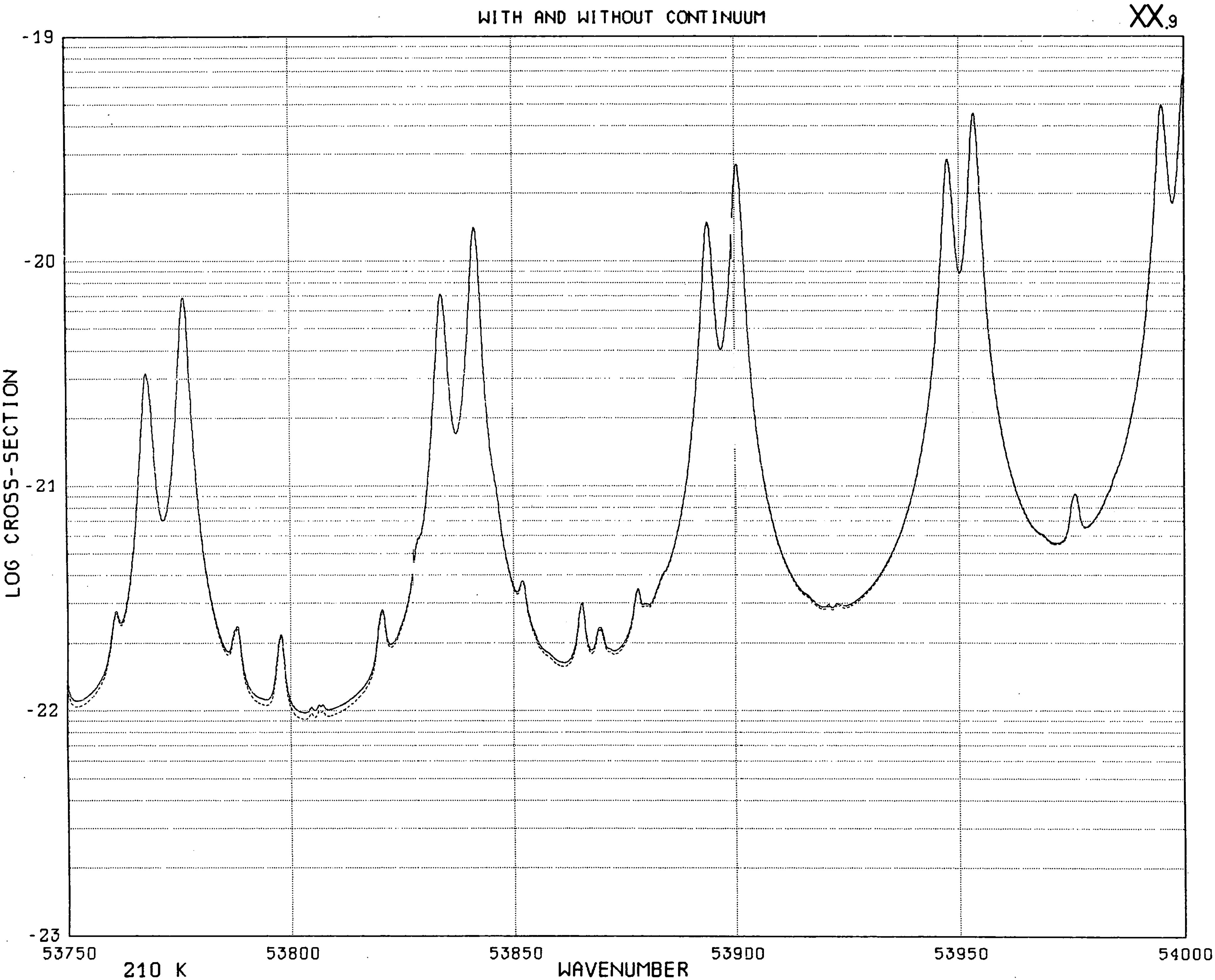

WITH AND WITHOUT CONTINUUM
XX.6
-19
-20
-21
-22
LOG CROSS-SECTION
53750
53800
53850
53900
53950
54000
270 K
WAVENUMBER

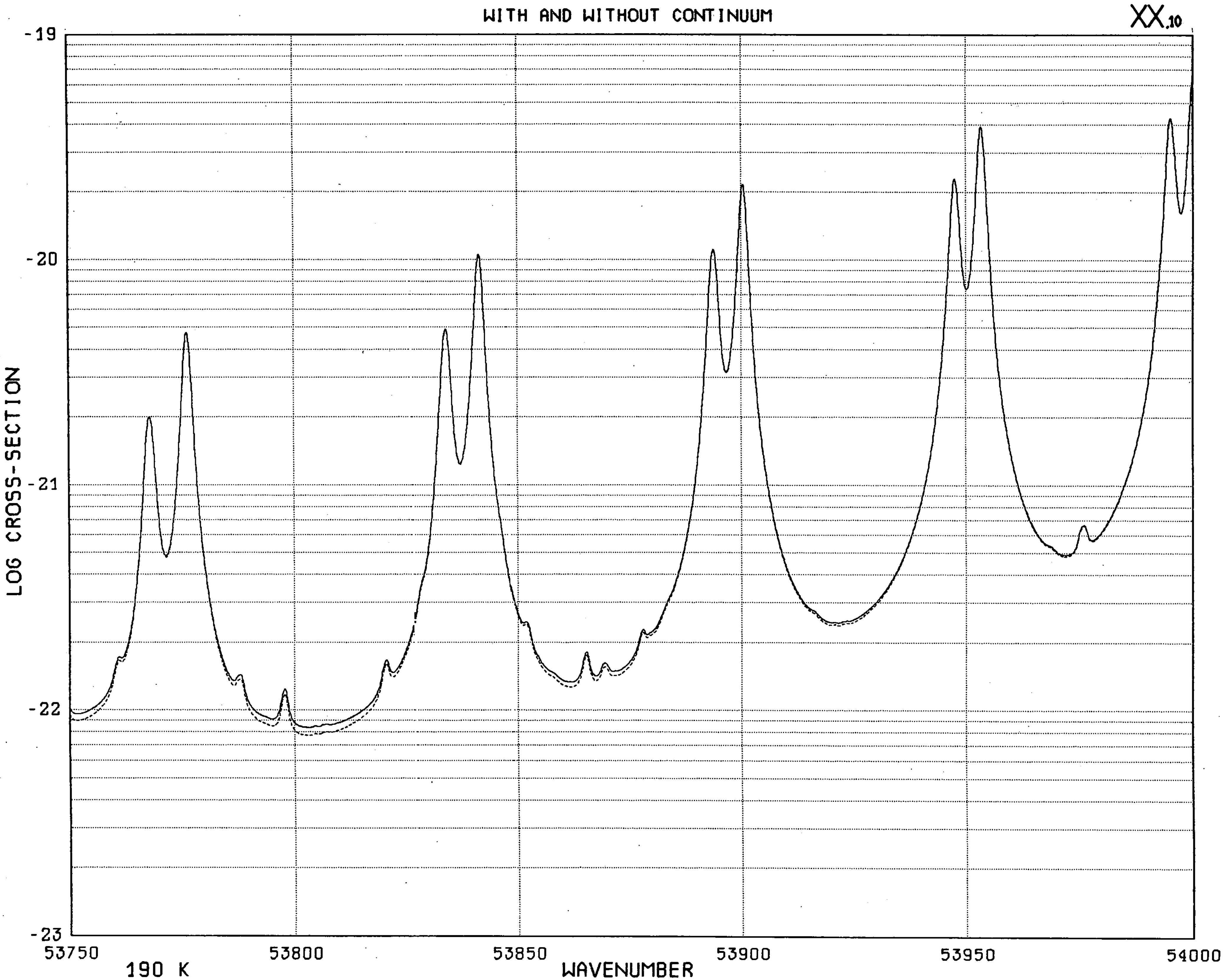
WITH AND WITHOUT CONTINUUM





WITH AND WITHOUT CONTINUUM
XX.8
LOG CROSS-SECTION
-19
-20
-21
-22
53750
53800
53850
53900
53950
54000
230 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
XX.9
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53750
53800
53850
53900
53950
54000
210 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
XX.10
LOG CROSS-SECTION
-19
-20
-21
-22
-23
53750
53800
53850
53900
53950
54000
190 K
WAVENUMBER

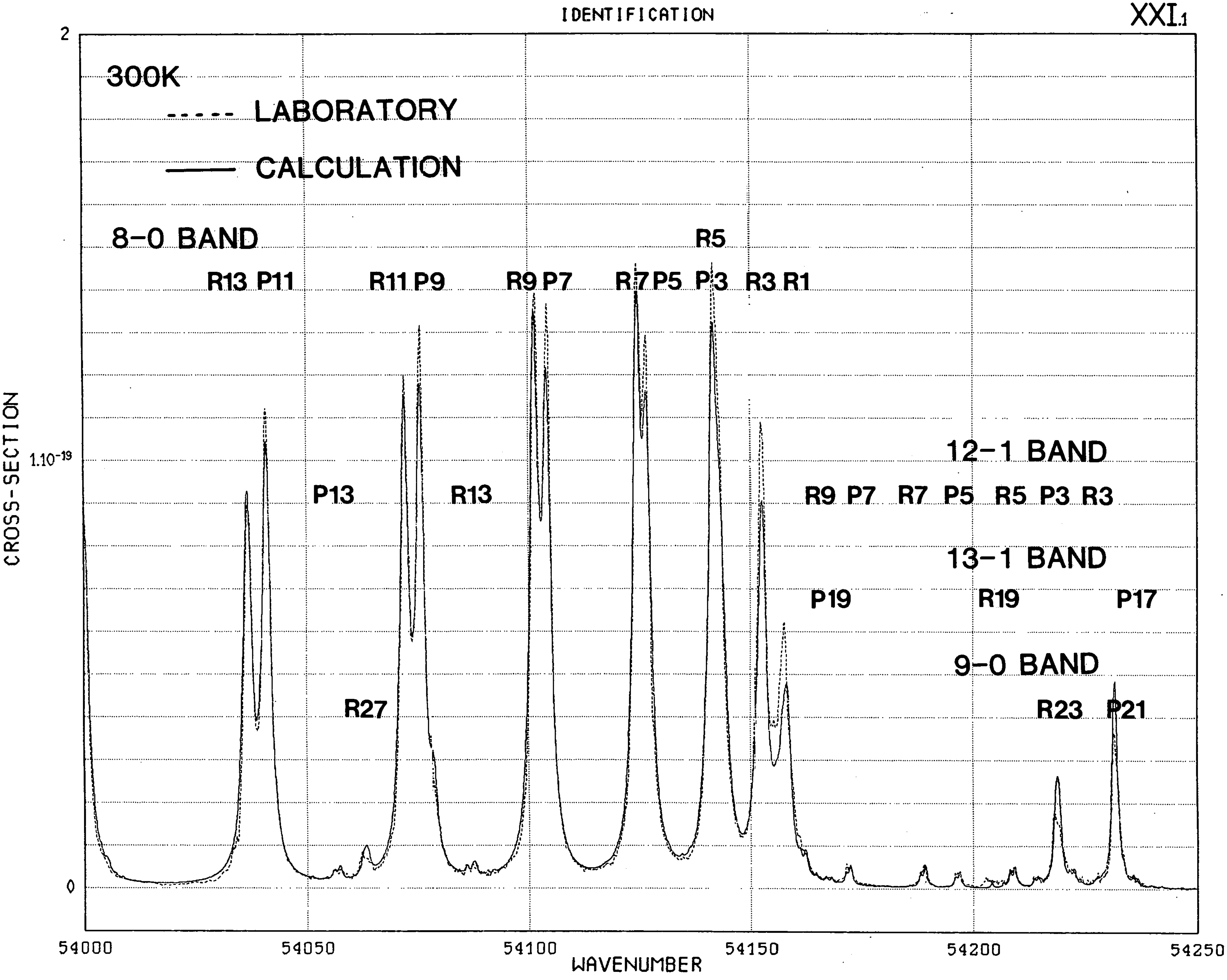
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
54000 - 54250 cm^{-1}

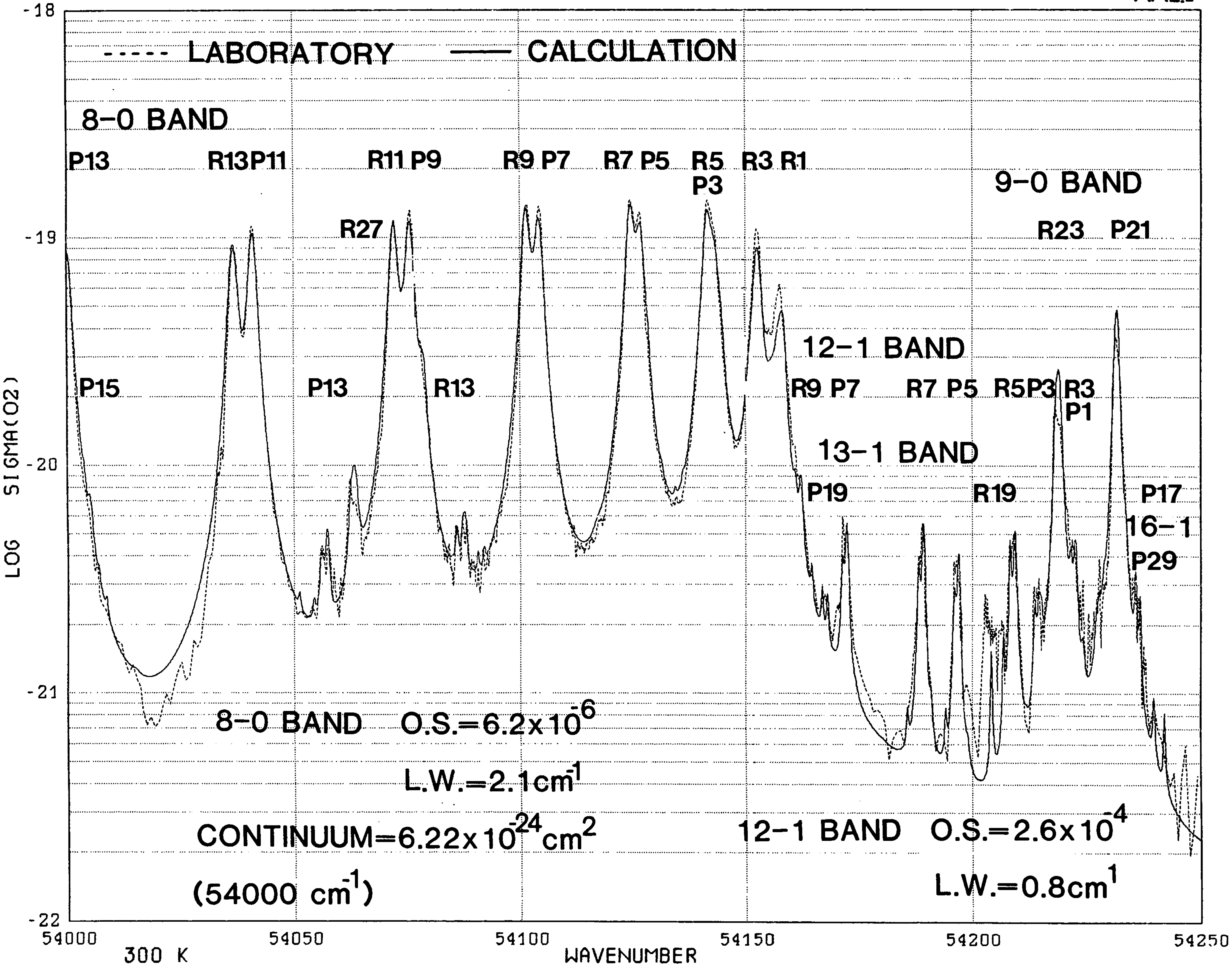
v	λ	band
54000		
54000.0	1851.85	8-0 P13
54000.2	1851.85	8-0 P13
54000.5	1851.84	8-0 P13
54003.7	1851.73	12-1 P15
54004.9	1851.68	12-1 P15
54005.4	1851.67	12-1 P15
54006.9	1851.62	13-1 P23
54008.5	1851.56	13-1 P23
54035.9	1850.62	14-1 P27
54036.4	1850.61	8-0 R13
54036.6	1850.60	8-0 R13
54037.0	1850.59	8-0 R13
54038.0	1850.55	12-1 R15
54039.4	1850.50	12-1 R15
54040.0	1850.48	12-1 R15
54040.8	1850.45	8-0 P11
54040.9	1850.45	14-1 P27
54041.2	1850.44	8-0 P11
54044.0	1850.34	14-1 P27
54050		
54051.2	1850.10	13-1 R23
54054.4	1849.99	13-1 R23
54056.0	1849.93	12-1 P13
54056.5	1849.92	13-1 R23
54057.2	1849.89	12-1 P13
54057.5	1849.88	12-1 P13
54062.6	1849.71	9-0 R27
54063.2	1849.69	9-0 R27
54063.7	1849.67	9-0 R27
54071.8	1849.39	8-0 R11
54072.0	1849.39	8-0 R11
54072.3	1849.38	8-0 R11
54075.5	1849.27	8-0 P 9
54075.6	1849.26	8-0 P 9
54075.9	1849.25	8-0 P 9
54078.2	1849.17	9-0 P25
54078.7	1849.16	9-0 P25
54079.0	1849.15	9-0 P25
54084.9	1848.95	14-1 R27
54086.0	1848.91	12-1 R13
54087.3	1848.86	12-1 R13
54087.8	1848.85	12-1 R13
54088.0	1848.84	13-1 P21
54090.6	1848.75	14-1 R27
54090.6	1848.75	13-1 P21
54092.0	1848.70	13-1 P21

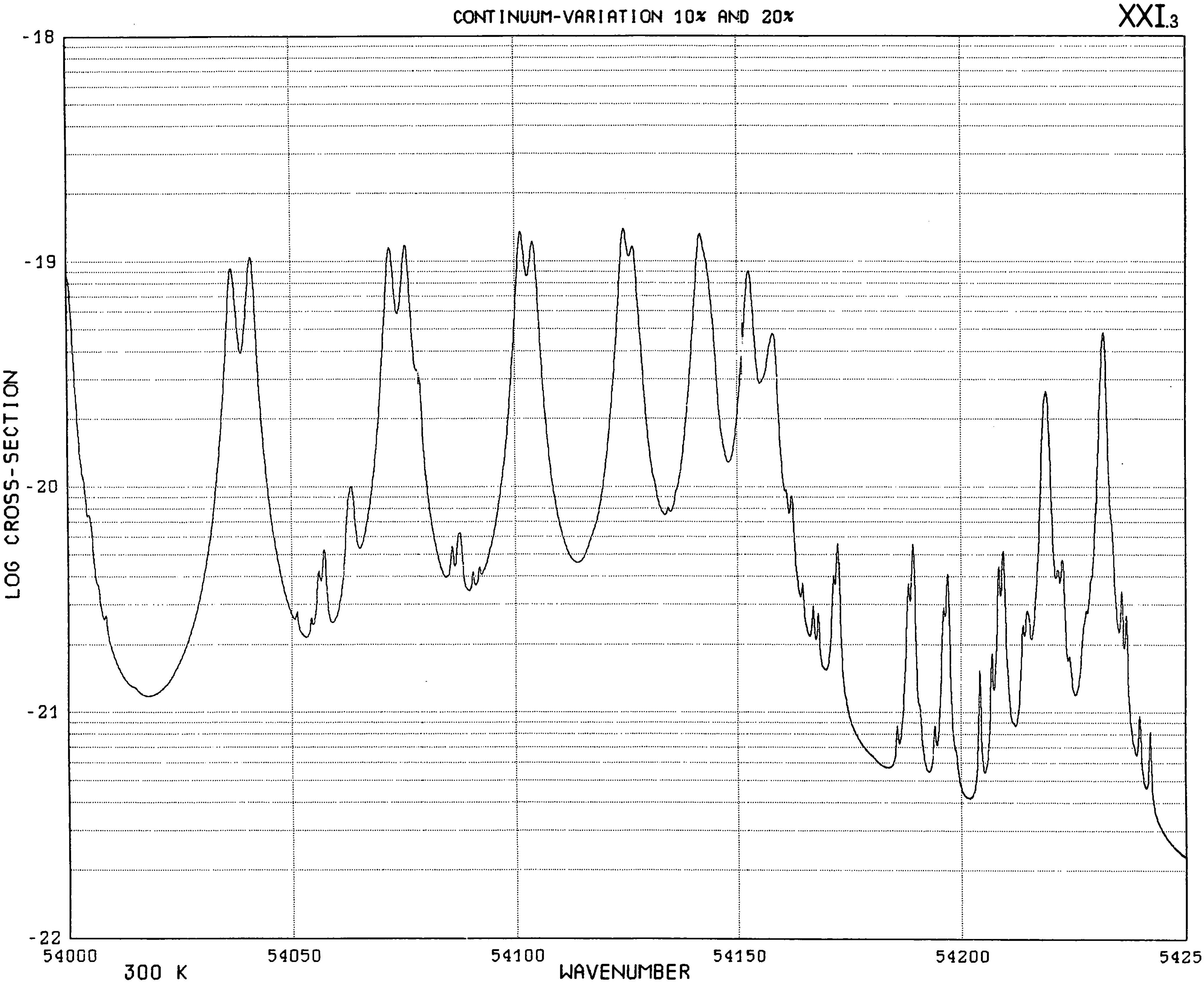
v	λ	band
54092.9	1848.67	15-1 P29
54094.3	1848.62	14-1 R27
54100		
54100.8	1848.40	15-1 P29
54101.1	1848.39	8-0 R 9
54101.3	1848.39	8-0 R 9
54101.4	1848.38	12-1 P11
54101.6	1848.38	8-0 R 9
54102.5	1848.34	12-1 P11
54102.7	1848.34	12-1 P11
54104.0	1848.29	8-0 P 7
54104.1	1848.29	8-0 P 7
54104.4	1848.28	8-0 P 7
54124.3	1847.60	8-0 R 7
54124.4	1847.59	8-0 R 7
54124.7	1847.58	8-0 R 7
54126.5	1847.52	8-0 P 5
54126.6	1847.52	8-0 P 5
54126.9	1847.51	8-0 P 5
54127.0	1847.51	12-1 R11
54128.2	1847.47	12-1 R11
54128.6	1847.45	12-1 R11
54131.5	1847.35	13-1 R21
54134.4	1847.26	13-1 R21
54136.1	1847.20	13-1 R21
54138.6	1847.11	15-1 R29
54139.8	1847.07	14-1 P25
54139.9	1847.07	12-1 P 9
54140.9	1847.03	12-1 P 9
54141.0	1847.03	12-1 P 9
54141.4	1847.02	8-0 R 5
54141.5	1847.01	8-0 R 5
54141.8	1847.00	8-0 R 5
54142.9	1846.96	8-0 P 3
54143.0	1846.96	8-0 P 3
54143.5	1846.94	8-0 P 3
54143.7	1846.94	9-0 R25
54144.3	1846.92	9-0 R25
54144.4	1846.91	14-1 P25
54144.7	1846.90	9-0 R25
54147.1	1846.82	14-1 P25
54147.4	1846.81	15-1 R29
54150		
54152.4	1846.64	8-0 R 3
54152.5	1846.64	8-0 R 3
54152.9	1846.62	8-0 R 3

v	λ	band
54153.1	1846.62	8-0 P 1
54153.1	1846.62	15-1 R29
54155.8	1846.52	8-0 Q 1
54157.2	1846.48	8-0 R 1
54157.4	1846.47	8-0 R 1
54158.0	1846.45	9-0 P23
54158.4	1846.44	9-0 P23
54158.7	1846.43	9-0 P23
54161.1	1846.35	12-1 R 9
54162.1	1846.31	12-1 R 9
54162.4	1846.30	12-1 R 9
54164.6	1846.22	13-1 P19
54167.0	1846.14	13-1 P19
54168.1	1846.10	13-1 P19
54171.5	1845.99	12-1 P 7
54172.4	1845.96	12-1 P 7
54172.5	1845.96	12-1 P 7
54185.8	1845.50	14-1 R25
54188.2	1845.42	12-1 R 7
54189.2	1845.39	12-1 R 7
54189.4	1845.38	12-1 R 7
54190.9	1845.33	14-1 R25
54194.1	1845.22	14-1 R25
54196.1	1845.15	12-1 P 5
54197.0	1845.12	12-1 P 5
54197.1	1845.12	12-1 P 5
54200		
54204.2	1844.88	13-1 R19
54206.9	1844.79	13-1 R19
54208.4	1844.73	13-1 R19
54208.4	1844.73	12-1 R 5
54209.3	1844.70	12-1 R 5
54209.5	1844.70	12-1 R 5
54210.7	1844.65	15-1 P27
54213.8	1844.55	12-1 P 3
54214.7	1844.52	12-1 P 3
54215.2	1844.50	12-1 P 3
54217.5	1844.42	16-1 P29
54217.9	1844.41	15-1 P27
54218.4	1844.39	9-0 R23
54219.0	1844.37	9-0 R23
54219.4	1844.36	9-0 R23
54221.6	1844.28	12-1 R 3
54222.2	1844.26	15-1 P27
54222.5	1844.25	12-1 R 3
54222.8	1844.24	12-1 R 3

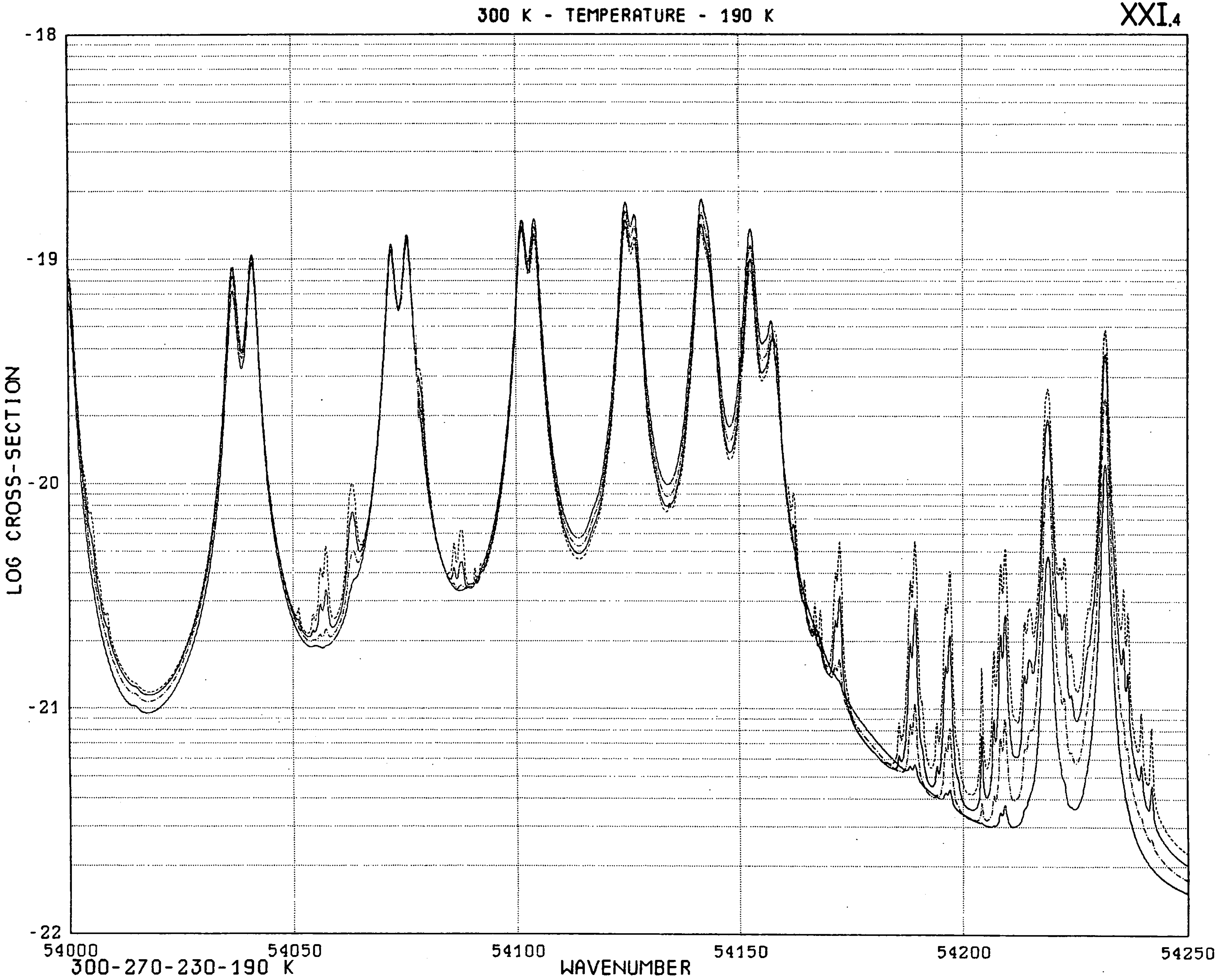
v	λ	band
54224.3	1844.19	12-1 P 1
54227.3	1844.09	12-1 Q 1
54227.9	1844.07	12-1 R 1
54228.9	1844.04	12-1 R 1
54229.1	1844.03	16-1 P29
54231.4	1843.95	9-0 P21
54231.8	1843.94	9-0 P21
54232.1	1843.93	9-0 P21
54233.8	1843.87	13-1 P17
54235.8	1843.80	14-1 P23
54235.9	1843.80	13-1 P17
54236.0	1843.79	16-1 P29
54236.9	1843.76	13-1 P17
54239.9	1843.66	14-1 P23
54242.2	1843.58	14-1 P23


IDENTIFICATION
300K
LABORATORY
CALCULATION
8-0 BAND
R5
R13 P11
R11 P9
R9 P7
R7 P5
P3
R3 R1
12-1 BAND
R9 P7
R7 P5
R5 P3 R3
13-1 BAND
P19
R19
P17
9-0 BAND
R23 P21
P13
R13
R27
CROSS-SECTION
2
1.10-19
0
54000
54050
54100
54150
54200
54250
WAVENUMBER

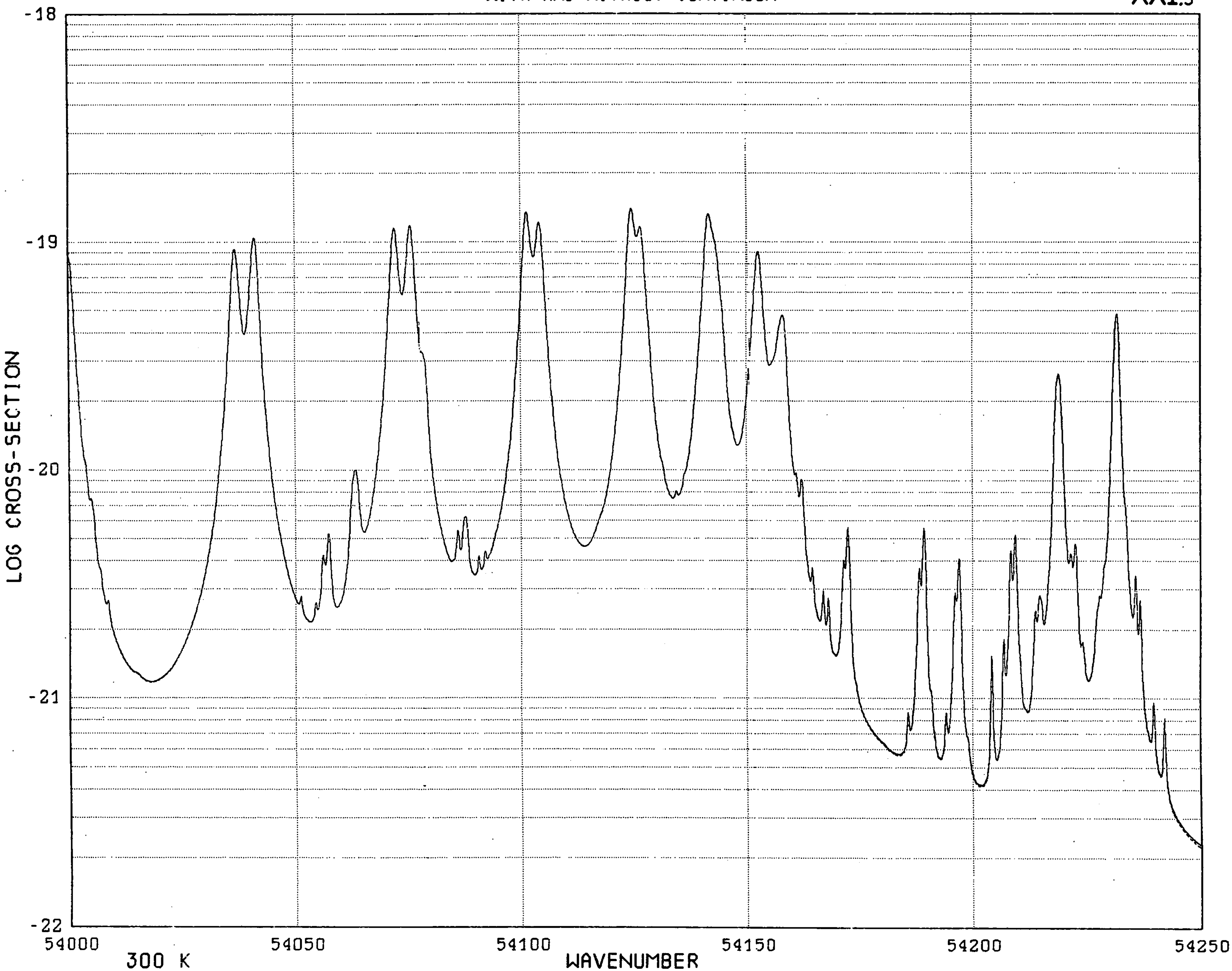

CROSS-SECTION
LABORATORY
CALCULATION
8-0 BAND
P13
R13P11
R11 P9
R9 P7
R7 P5
R5
P3
R3 R1
9-0 BAND
R27
R23
P21
12-1 BAND
P15
P13
R13
R9 P7
R7 P5
R5P3
R3
P1
13-1 BAND
P19
R19
P17
16-1
P29
8-0 BAND O.S.=6.2x10-6
L.W.=2.1cm-1
CONTINUUM=6.22x10-24cm2
(54000 cm-1)
12-1 BAND O.S.=2.6x10-4
L.W.=0.8cm-1
-18
-19
-20
-21
-22
LOG SIGMA(O2)
54000
54050
54100
54150
54200
54250
300 K
WAVENUMBER

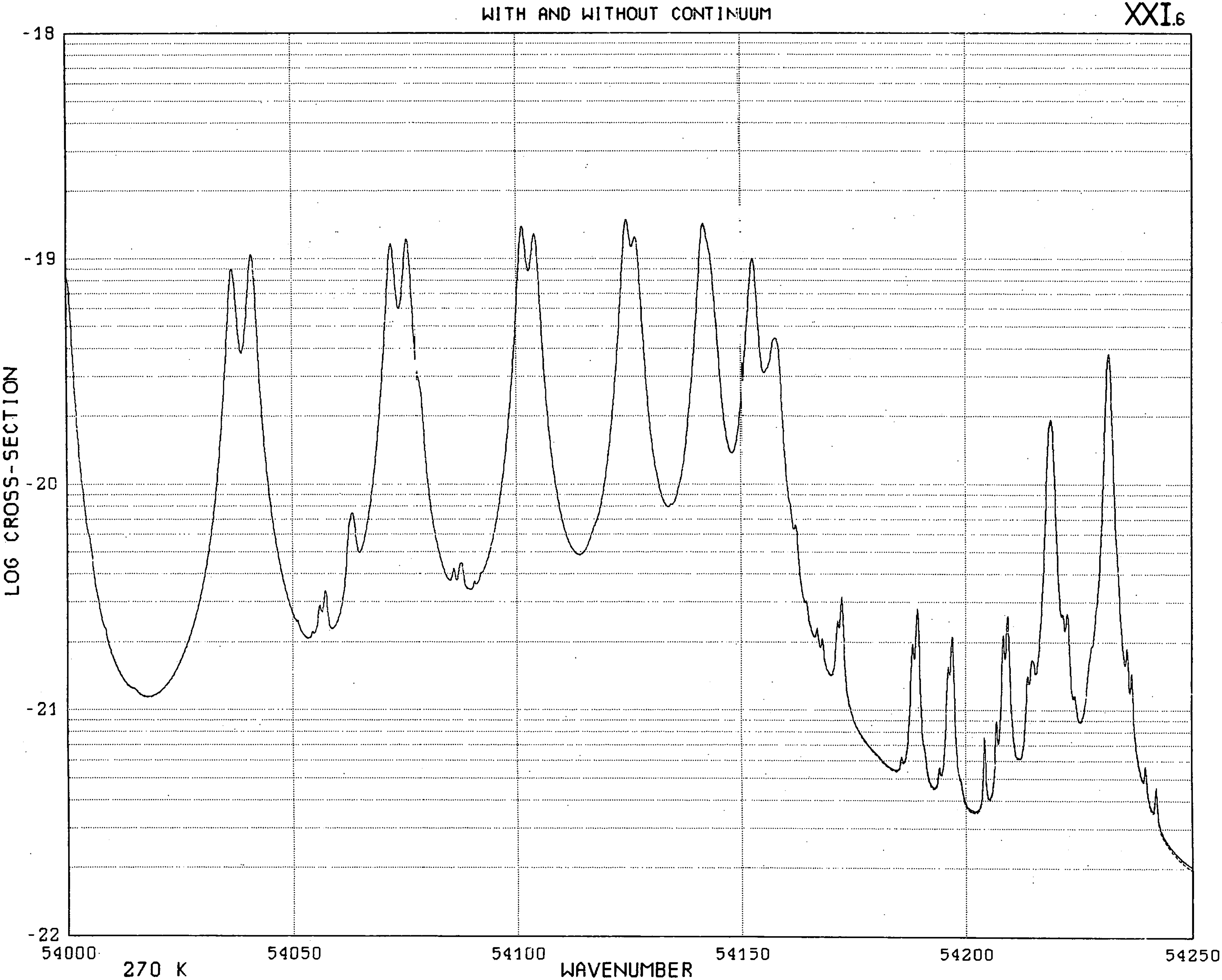


CONTINUUM-VARIATION 10% AND 20%
XXI.3
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54000
54050
54100
54150
54200
54250
300 K
WAVENUMBER

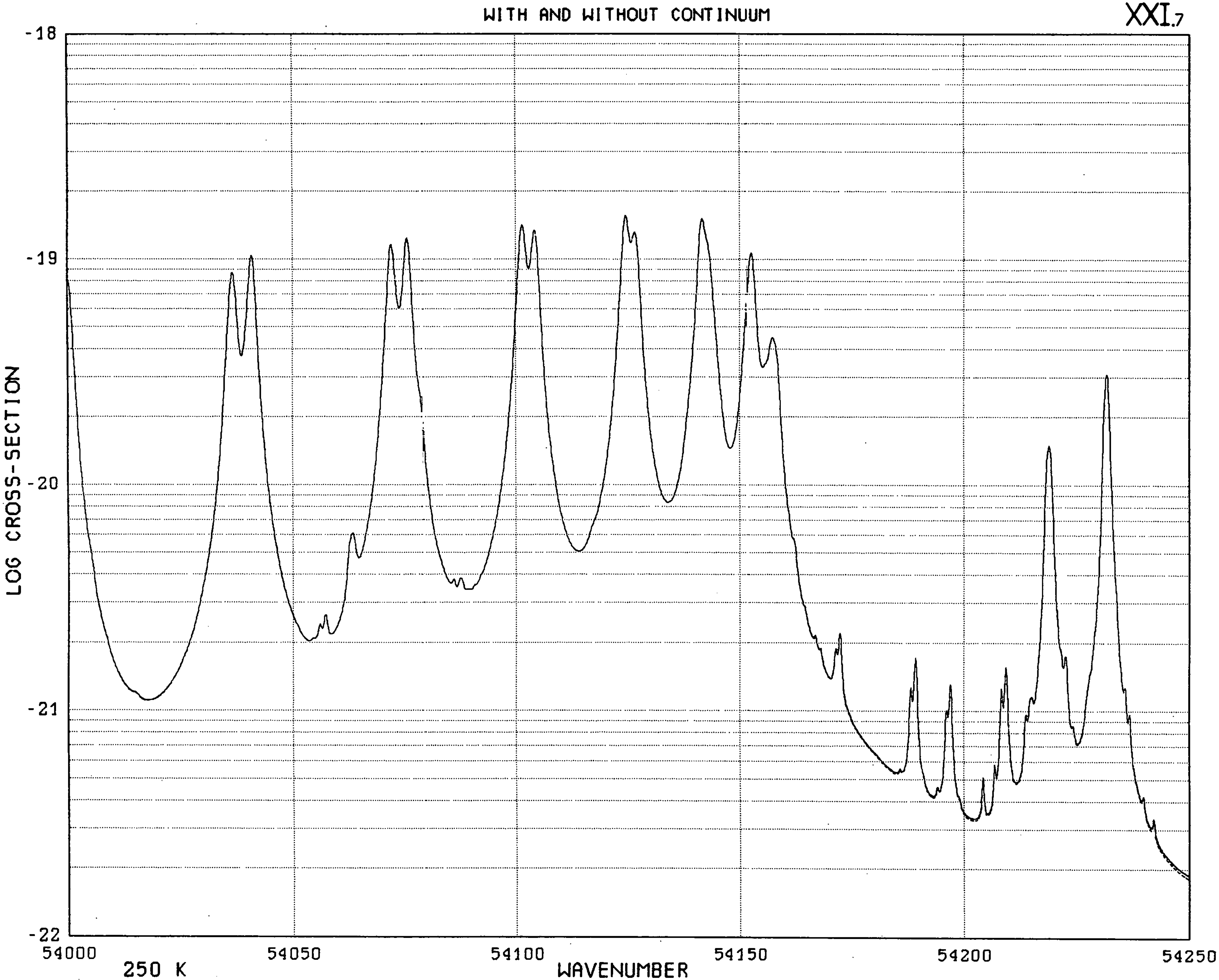

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54000
54050
54100
54150
54200
54250
WAVENUMBER
300-270-230-190 K

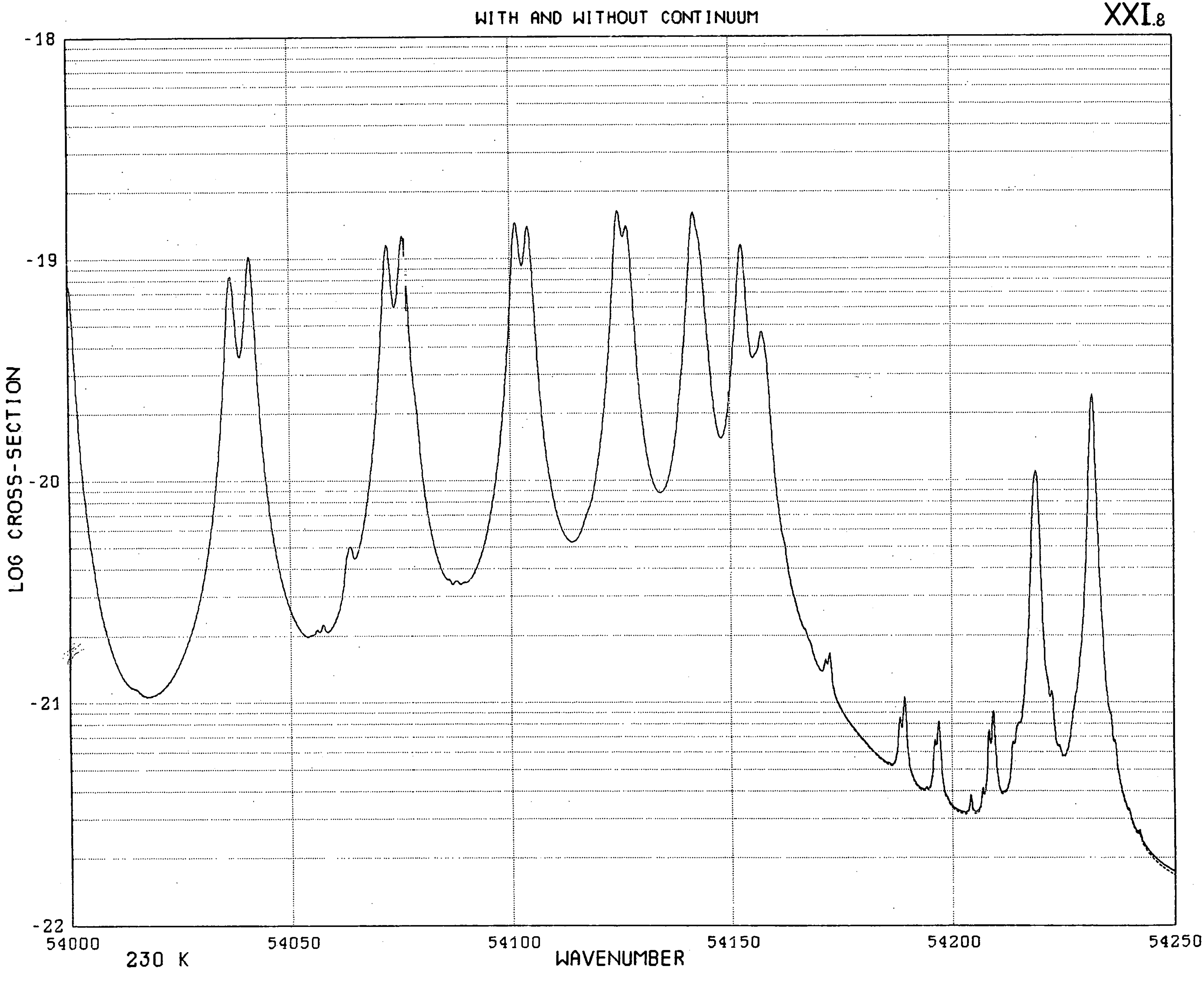
WITH AND WITHOUT CONTINUUM

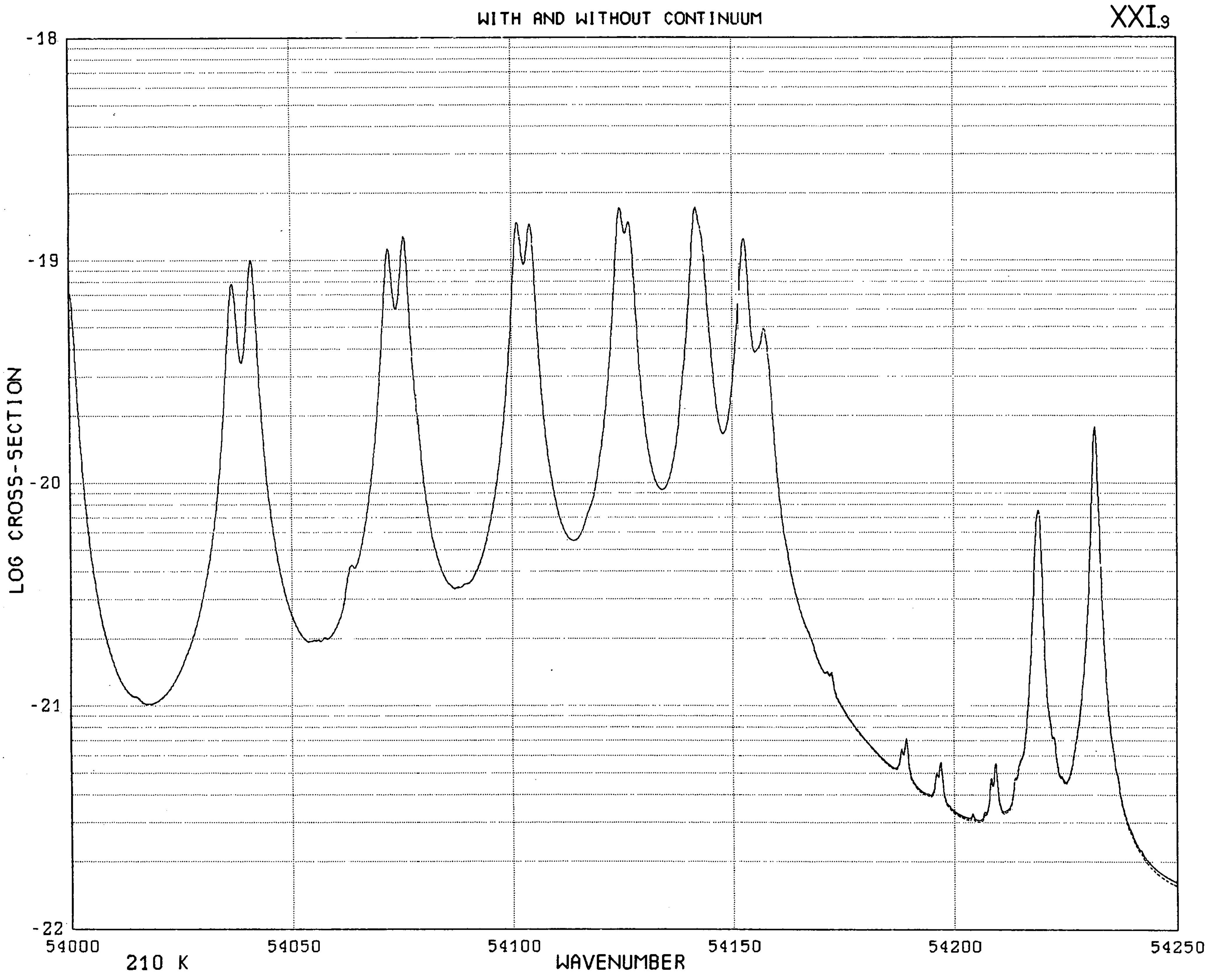



WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54000
54050
54100
54150
54200
54250
270 K
WAVENUMBER

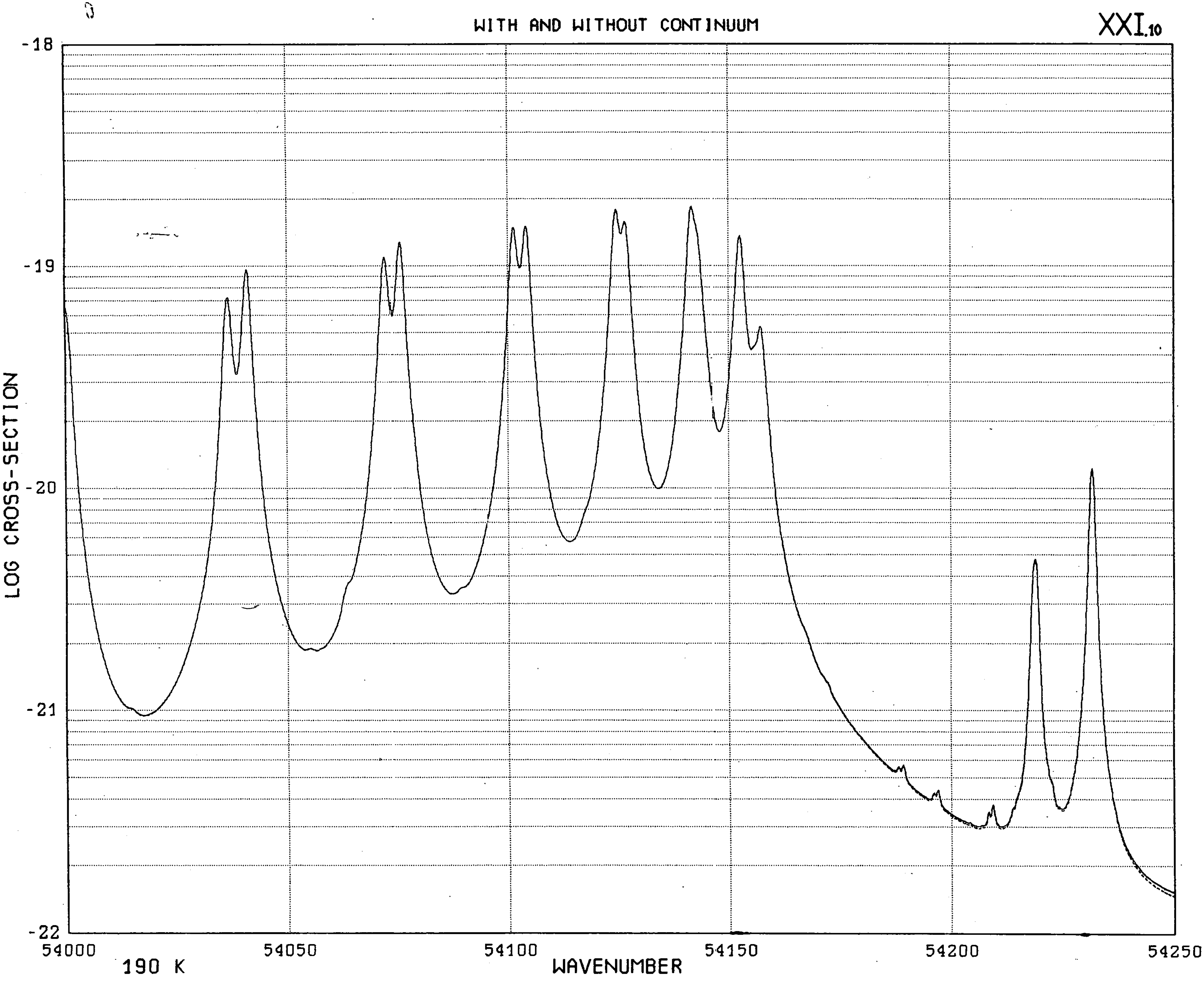
XXI.7


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54000
54050
54100
54150
54200
54250
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54000
54050
54100
54150
54200
54250
230 K
WAVENUMBER



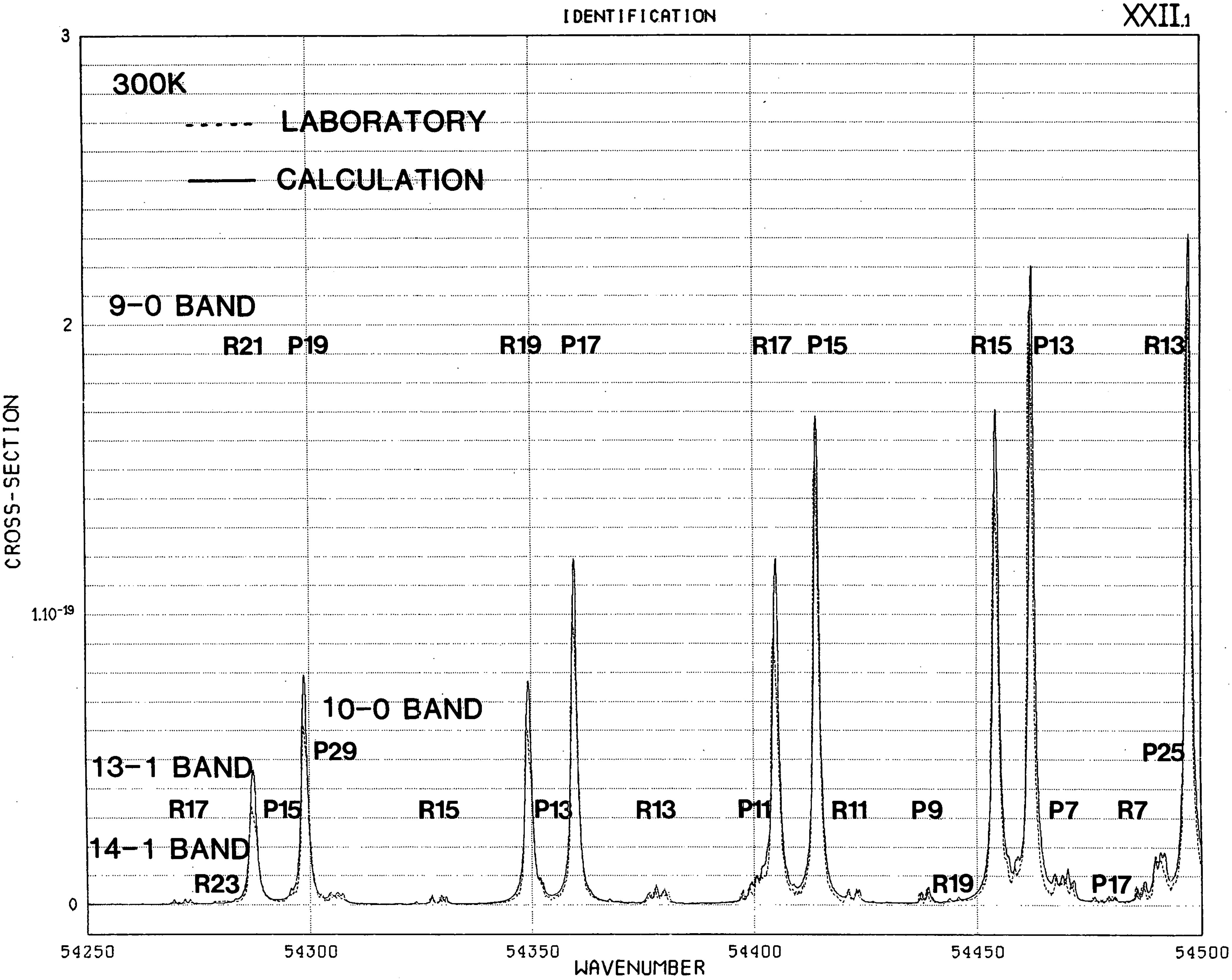
WITH AND WITHOUT CONTINUUM
XXI.9
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54000
54050
54100
54150
54200
54250
210 K
WAVENUMBER

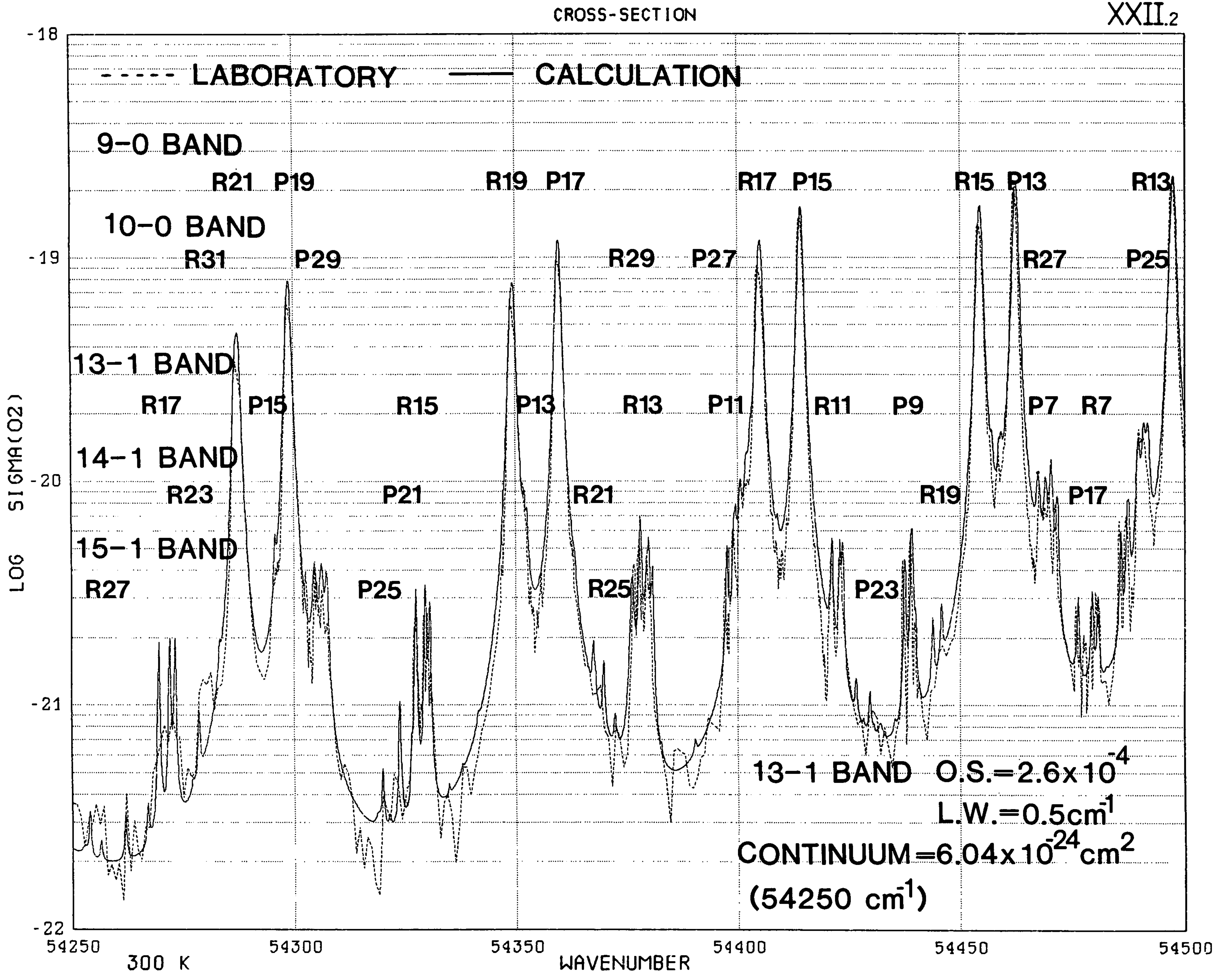

WITH AND WITHOUT CONTINUUM
XXI.10
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54000
54050
54100
54150
54200
54250
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES

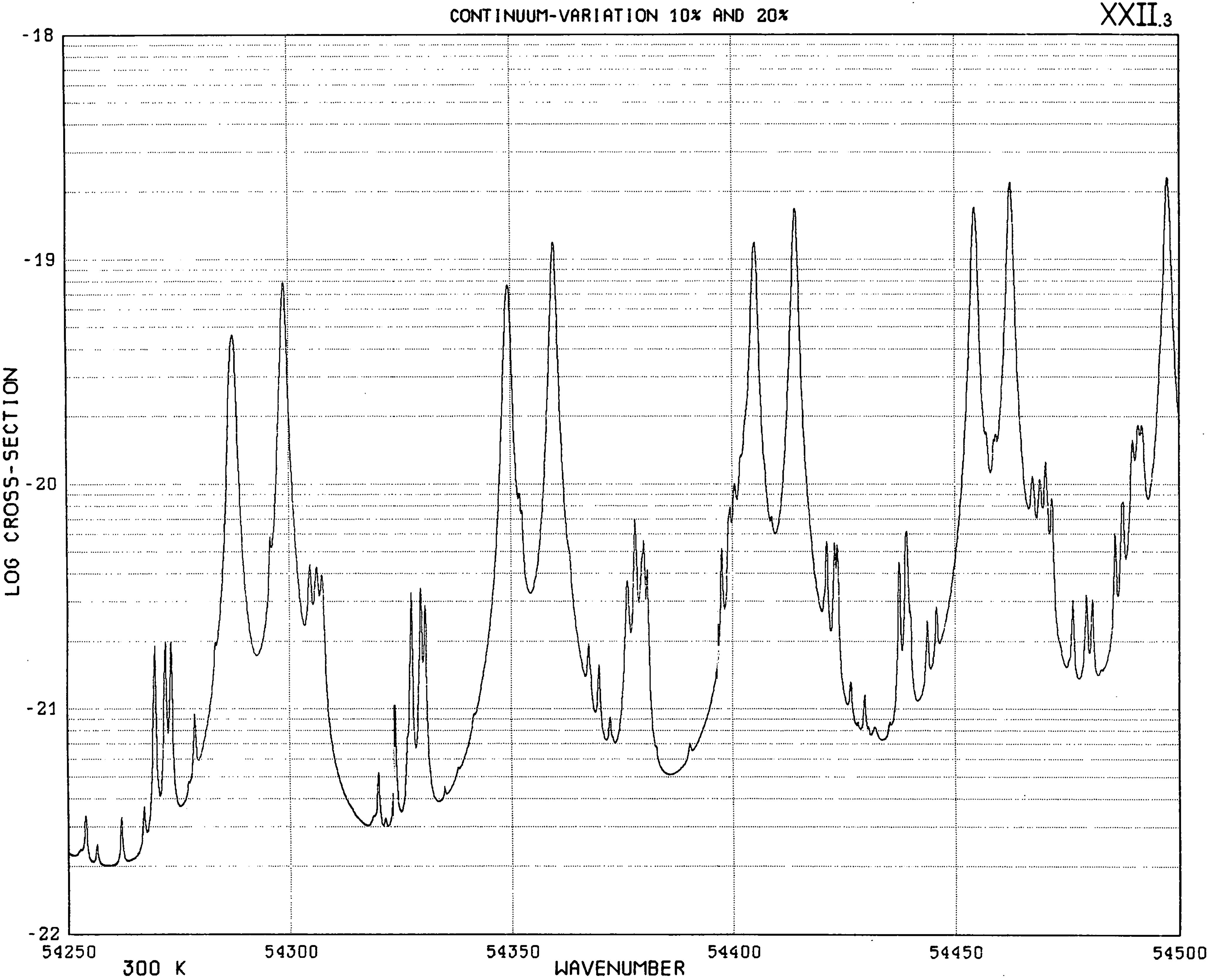
54250 - 54500 cm^{-1}

v	λ	band
54250		
54254.0	1843.18	15-1 R27
54262.0	1842.91	15-1 R27
54267.0	1842.74	15-1 R27
54269.2	1842.67	16-1 R29
54269.5	1842.65	13-1 R17
54271.9	1842.57	13-1 R17
54273.2	1842.53	13-1 R17
54277.1	1842.40	16-1 R29
54278.5	1842.35	14-1 R23
54283.2	1842.19	14-1 R23
54286.0	1842.10	14-1 R23
54286.9	1842.07	9-0 R21
54287.3	1842.05	9-0 R21
54287.7	1842.04	9-0 R21
54295.7	1841.77	13-1 P15
54297.6	1841.70	13-1 P15
54298.4	1841.68	13-1 P15
54298.6	1841.67	9-0 P19
54298.9	1841.66	9-0 P19
54299.2	1841.65	9-0 P19
54300		
54304.6	1841.46	10-0 P29
54305.4	1841.44	17-1 P29
54306.1	1841.41	10-0 P29
54307.3	1841.37	10-0 P29
54319.9	1840.95	15-1 P25
54321.5	1840.89	17-1 P29
54323.8	1840.81	14-1 P21
54326.5	1840.72	15-1 P25
54327.5	1840.69	13-1 R15
54327.5	1840.69	14-1 P21
54329.5	1840.62	14-1 P21
54329.6	1840.62	13-1 R15
54330.2	1840.60	15-1 P25
54330.6	1840.58	13-1 R15
54330.6	1840.58	17-1 P29
54334.9	1840.44	18-1 P29
54337.9	1840.34	17-1 R29
54341.5	1840.21	16-1 P27
54348.9	1839.96	9-0 R19
54349.4	1839.95	9-0 R19
54349.7	1839.94	9-0 R19
54350		
54350.3	1839.92	13-1 P13
54352.0	1839.86	13-1 P13
54352.6	1839.84	13-1 P13
54355.3	1839.75	18-1 R29
54355.4	1839.74	17-1 R29
54358.1	1839.65	16-1 P27
54358.9	1839.63	18-1 P29
54359.4	1839.61	9-0 P17
54359.8	1839.60	9-0 P17
54359.9	1839.59	9-0 P17
54360.6	1839.57	15-1 R25
54363.2	1839.48	14-1 R21
54365.9	1839.39	17-1 R29
54367.4	1839.34	14-1 R21
54369.8	1839.26	14-1 R21
54372.3	1839.17	15-1 R25
54372.9	1839.15	18-1 P29
54376.2	1839.04	10-0 R29
54378.0	1838.98	10-0 R29
54378.0	1838.98	13-1 R13
54378.6	1838.96	16-1 R27
54379.5	1838.93	10-0 R29
54380.0	1838.91	13-1 R13
54380.8	1838.88	13-1 R13
54381.5	1838.86	18-1 R29
54382.7	1838.82	19-1 P29
54390.3	1838.56	16-1 R27
54397.3	1838.33	16-1 R27
54397.5	1838.32	13-1 P11
54397.6	1838.32	18-1 R29
54399.1	1838.27	13-1 P11
54399.2	1838.26	19-1 R29
54399.5	1838.25	13-1 P11
54400		
54400.5	1838.22	10-0 P27
54401.9	1838.17	10-0 P27
54402.9	1838.14	10-0 P27
54404.0	1838.10	14-1 P19
54404.7	1838.08	9-0 R17
54405.1	1838.06	9-0 R17
54405.4	1838.05	9-0 R17
54407.4	1837.99	14-1 P19
54409.0	1837.93	14-1 P19
54411.7	1837.84	19-1 P29
54414.0	1837.76	9-0 P15
54414.3	1837.75	9-0 P15
54414.4	1837.75	9-0 P15
54420.6	1837.54	15-1 P23
54421.2	1837.52	13-1 R11
54423.0	1837.46	13-1 R11
54423.6	1837.44	13-1 R11
54426.6	1837.34	15-1 P23
54428.3	1837.28	19-1 P29
54430.6	1837.20	19-1 R29
54435.3	1837.04	17-1 P27
54437.5	1836.97	13-1 P 9
54439.0	1836.92	13-1 P 9
54439.3	1836.91	13-1 P 9
54440.0	1836.88	14-1 R19
54443.8	1836.76	14-1 R19
54445.8	1836.69	14-1 R19
54449.6	1836.56	19-1 R29
54450		
54450.2	1836.54	17-1 P27
54454.1	1836.41	9-0 R15
54454.5	1836.40	9-0 R15
54454.7	1836.39	9-0 R15
54456.4	1836.33	16-1 P25
54457.2	1836.31	13-1 R 9
54458.2	1836.27	17-1 P27
54458.6	1836.26	15-1 R23
54458.8	1836.25	13-1 R 9
54459.2	1836.24	13-1 R 9
54462.2	1836.14	9-0 P13
54462.5	1836.13	9-0 P13
54462.6	1836.12	9-0 P13
54465.3	1836.03	15-1 R23
54466.1	1836.00	16-1 P25
54466.5	1835.99	17-1 R27
54467.5	1835.96	10-0 R27
54469.0	1835.90	15-1 R23
54469.1	1835.90	10-0 R27
54470.3	1835.86	13-1 P 7
54470.4	1835.86	10-0 R27
54471.3	1835.83	16-1 P25
54471.6	1835.82	13-1 P 7
54471.9	1835.81	13-1 P 7
54475.5	1835.69	18-1 P27
54476.3	1835.66	14-1 P17
54479.4	1835.55	14-1 P17
54480.7	1835.51	14-1 P17
54482.7	1835.45	17-1 R27
54485.8	1835.34	13-1 R 7
54487.3	1835.29	13-1 R 7
54487.6	1835.28	13-1 R 7
54489.7	1835.21	10-0 P25
54491.0	1835.17	10-0 P25
54491.4	1835.15	16-1 R25
54491.9	1835.13	10-0 P25
54492.0	1835.13	17-1 R27
54495.8	1835.00	13-1 P 5
54496.0	1835.00	18-1 R27
54497.0	1834.96	13-1 P 5
54497.2	1834.96	9-0 R13
54497.3	1834.95	13-1 P 5
54497.5	1834.95	9-0 R13
54497.7	1834.94	18-1 P27
54497.7	1834.94	9-0 R13

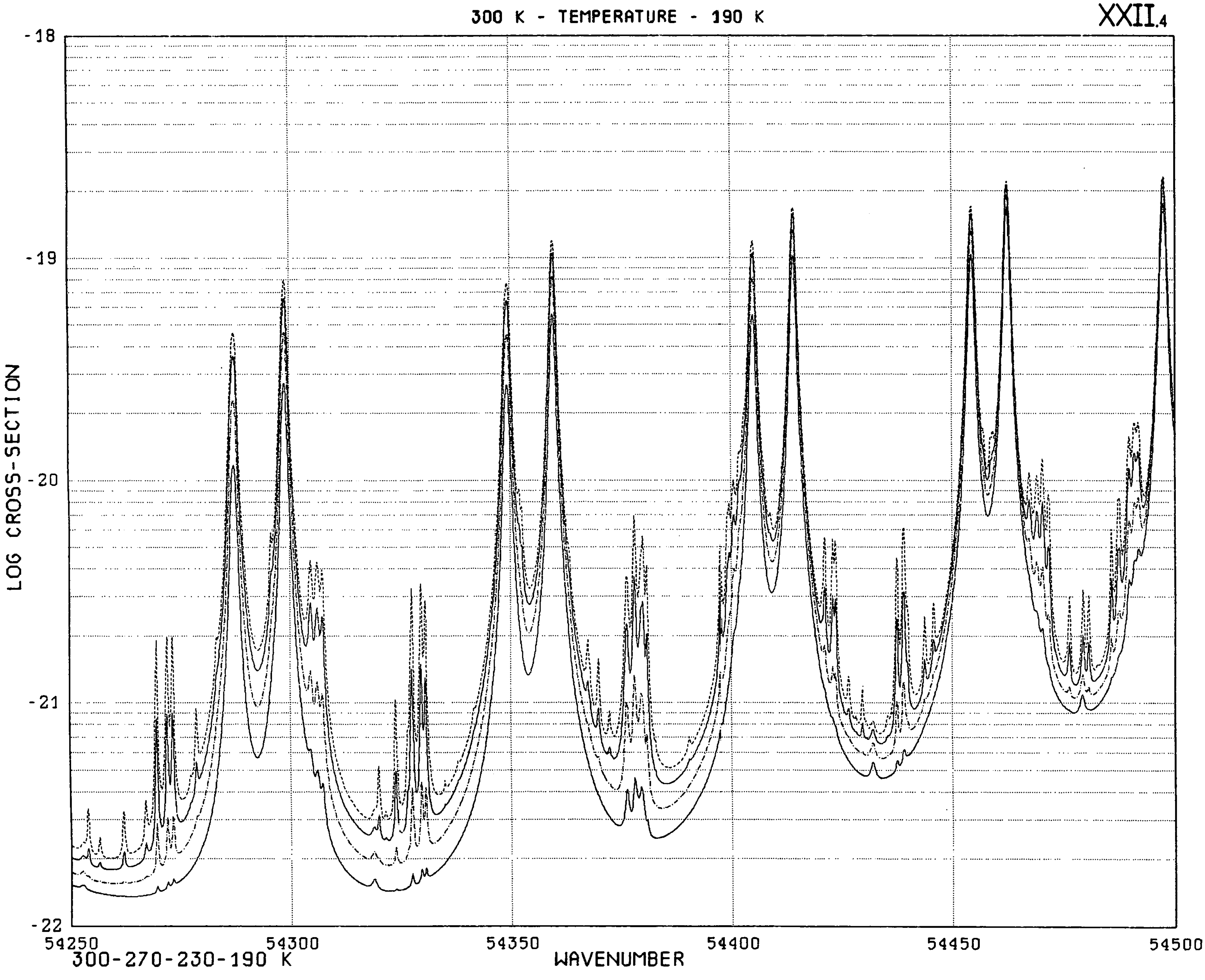

IDENTIFICATION
300K
LABORATORY
CALCULATION
9-0 BAND
R21 P19 R19 P17 R17 P15 R15 P13 R13
10-0 BAND
P29
P25
13-1 BAND
R17 P15 R15 P13 R13 P11 R11 P9 P7 R7
14-1 BAND
R23
R19
P17
CROSS-SECTION
3
2
1.10^-19
0
54250
54300
54350
54400
54450
54500
WAVENUMBER

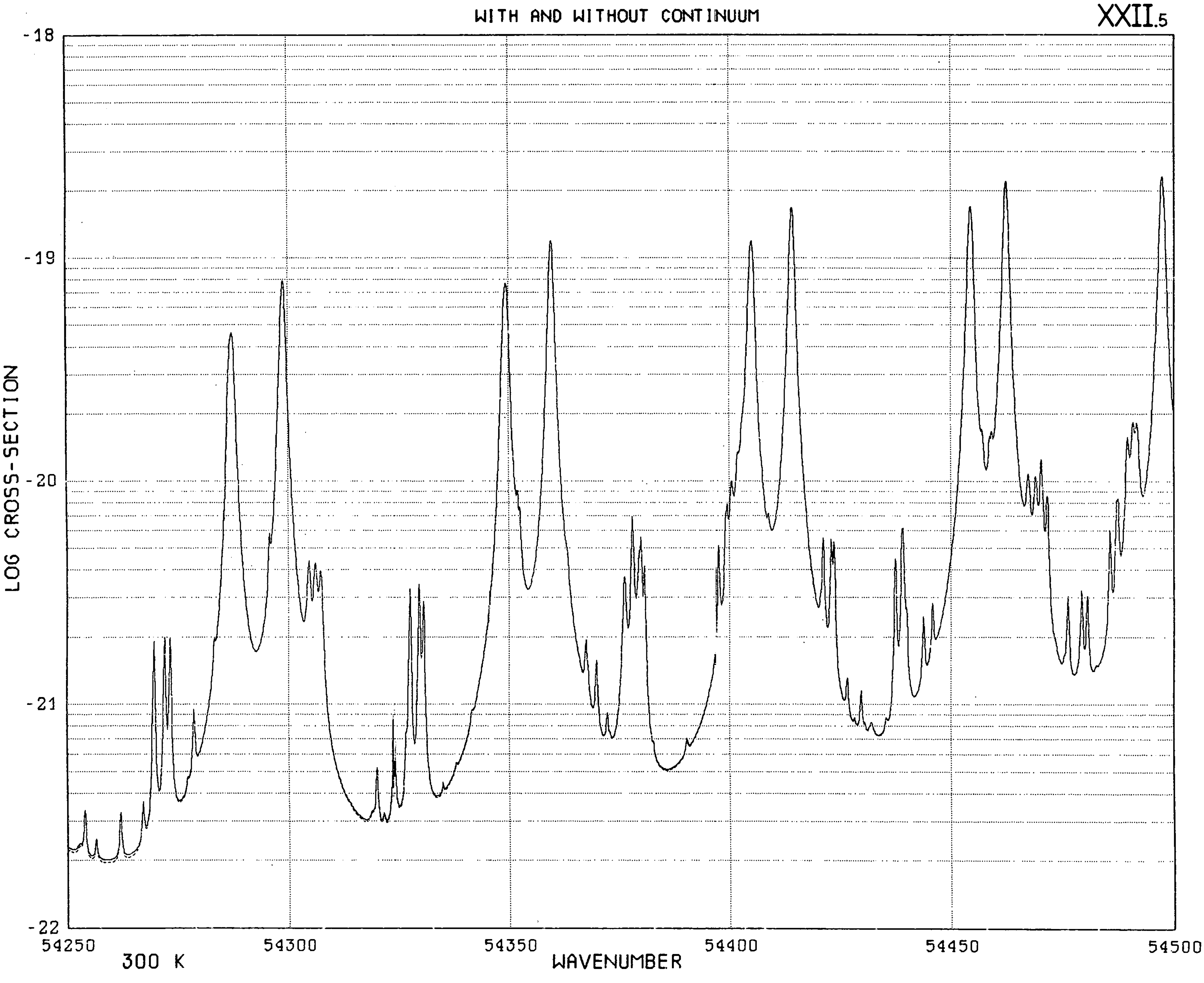

CROSS-SECTION
LABORATORY
CALCULATION
9-0 BAND
R21 P19
R19 P17
R17 P15
R15 P13
R13
10-0 BAND
R31 P29
R29 P27
R27 P25
13-1 BAND
R17 P15
R15 P13
R13 P11
R11 P9
P7 R7
14-1 BAND
R23 P21 R21 R19 P17
15-1 BAND
R27 P25 R25 P23
13-1 BAND O.S.=2.6x10-4
L.W.=0.5cm-1
CONTINUUM=6.04x10-24cm2
(54250 cm-1)
LOG SIGMA(O2)
-18
-19
-20
-21
-22
54250
54300
54350
54400
54450
54500
300 K
WAVENUMBER

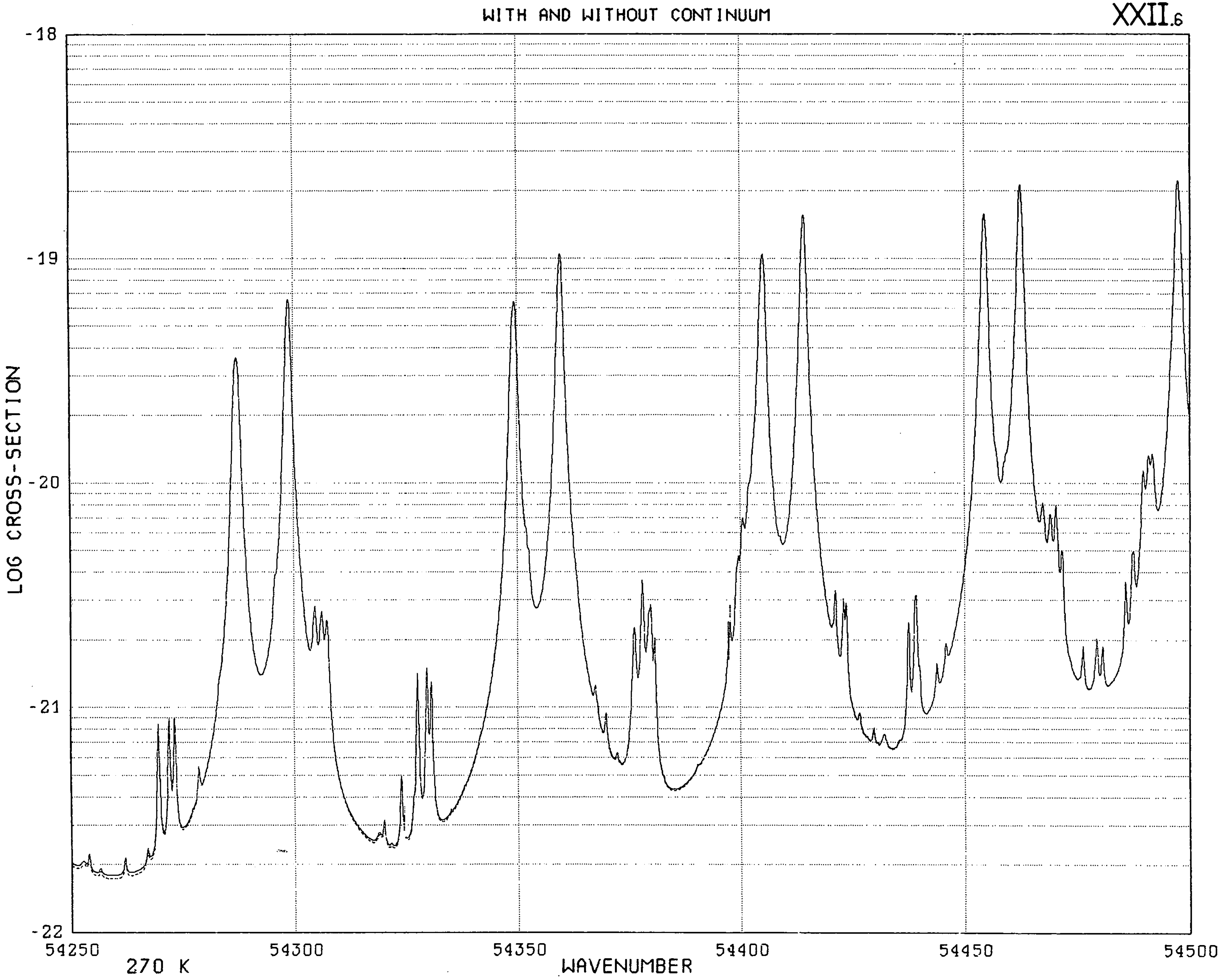
XXII.3

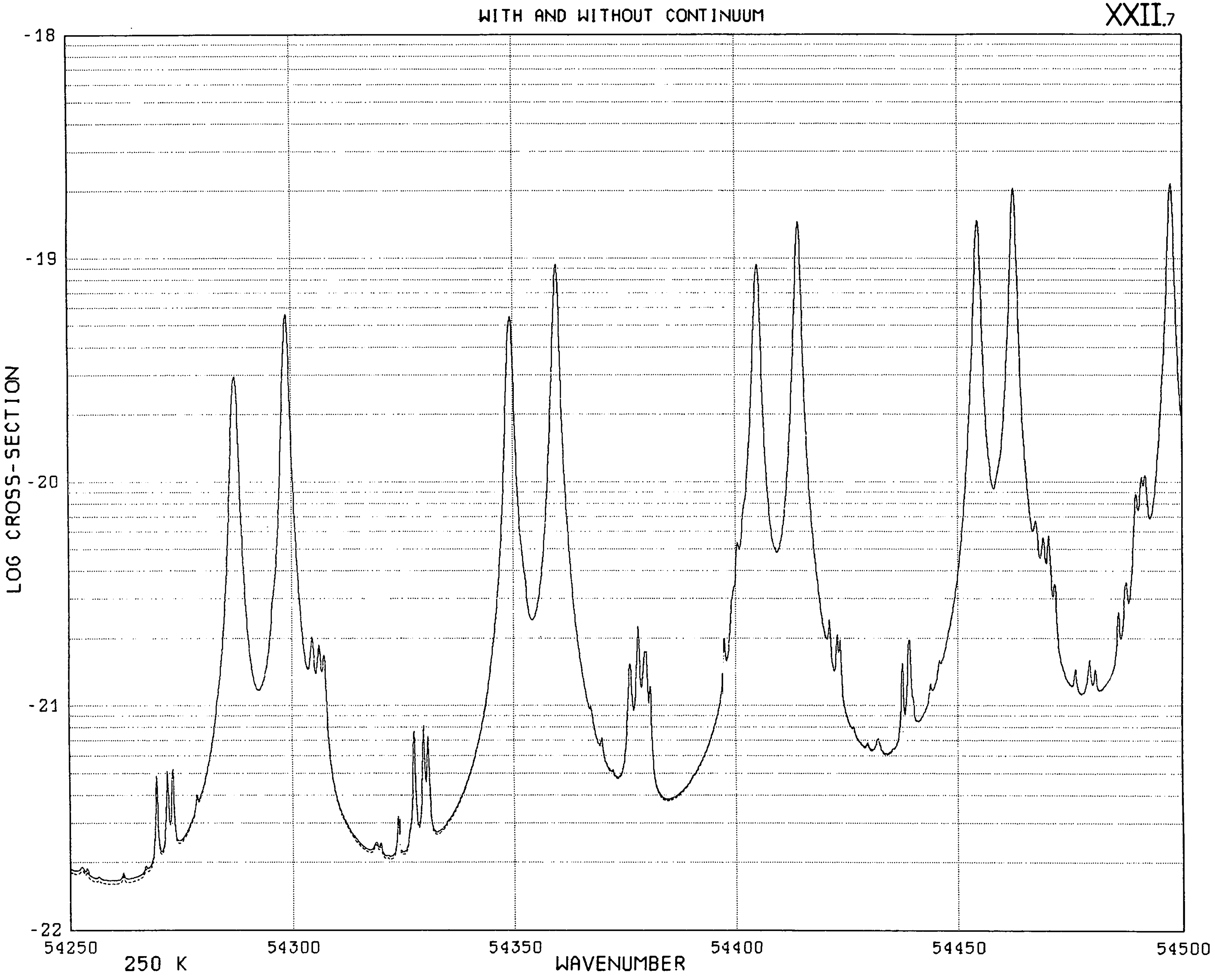


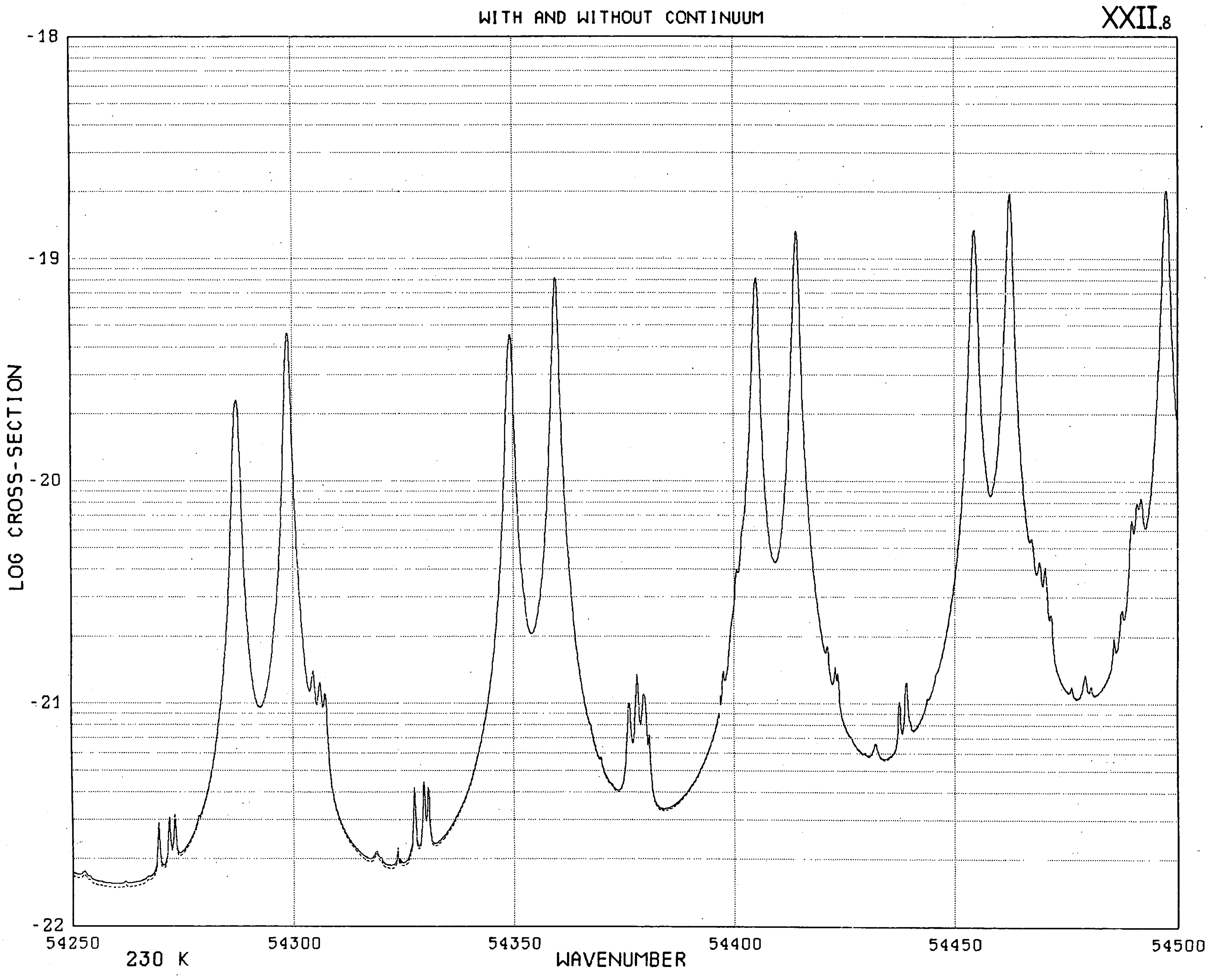
CONTINUUM-VARIATION 10% AND 20%
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54250
54300
54350
54400
54450
54500
300 K
WAVENUMBER

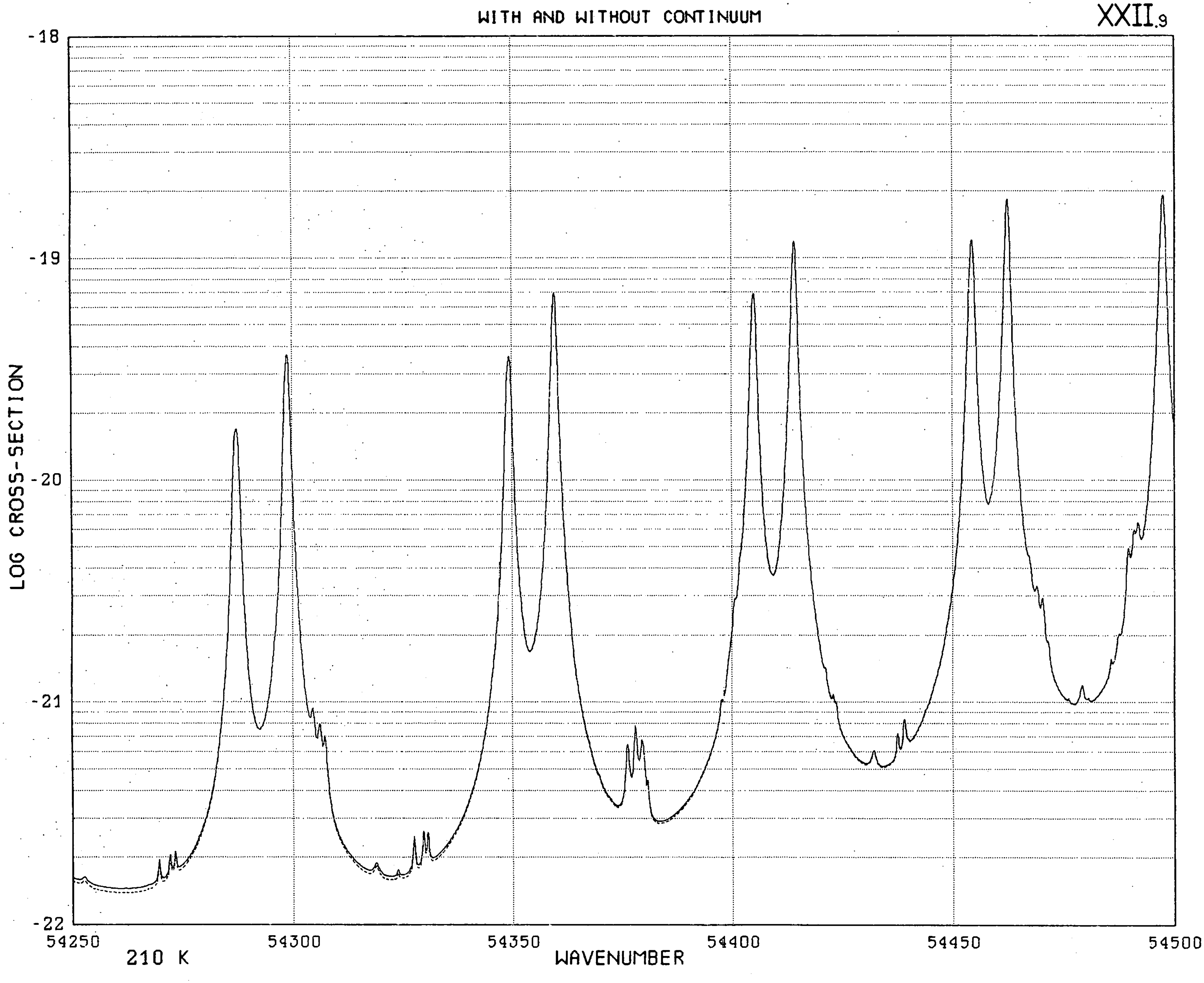

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54250
54300
54350
54400
54450
54500
300-270-230-190 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
XXII.5
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54250
54300
54350
54400
54450
54500
300 K
WAVENUMBER

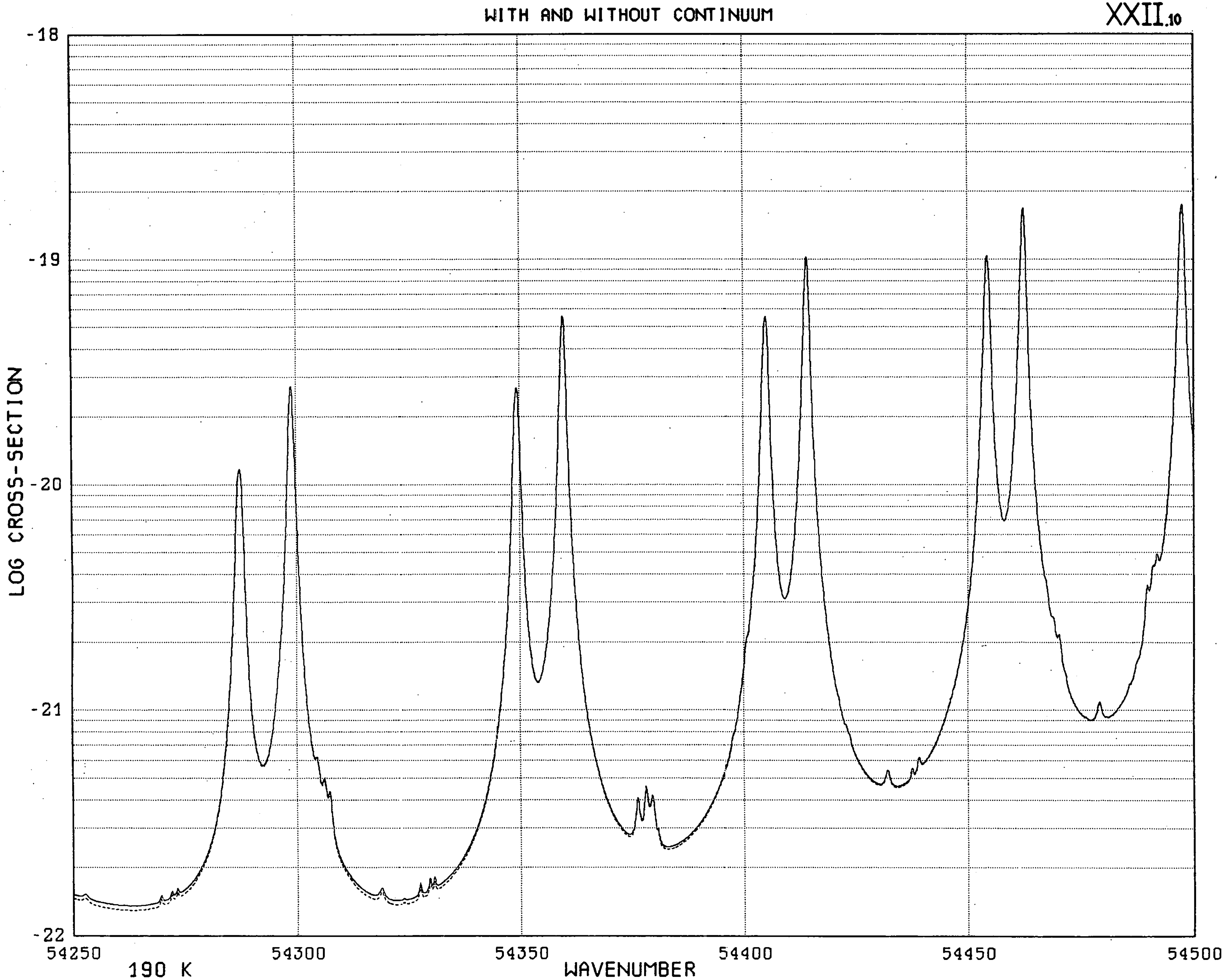

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54250
54300
54350
54400
54450
54500
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54250
54300
54350
54400
54450
54500
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54250
54300
54350
54400
54450
54500
230 K
WAVENUMBER

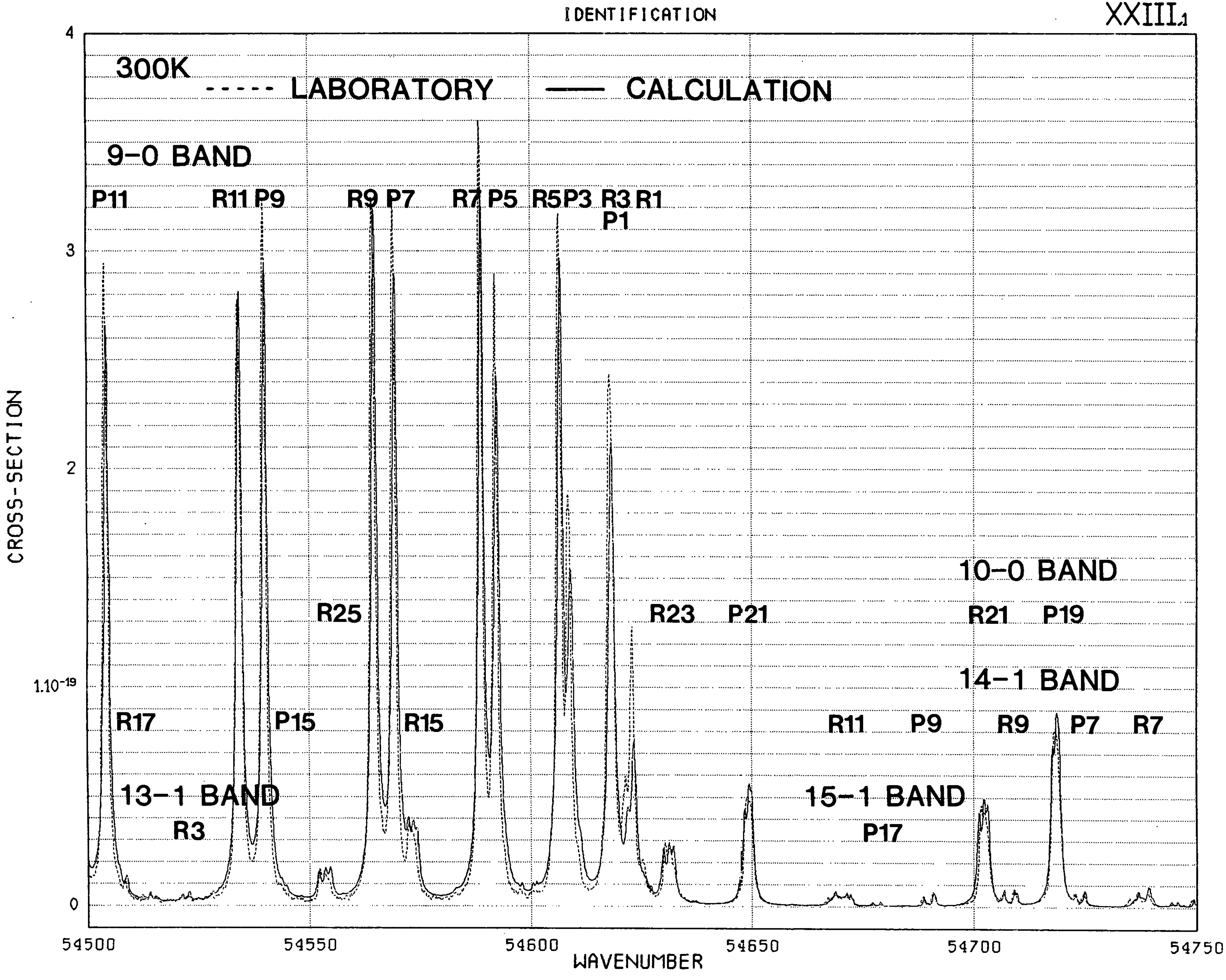


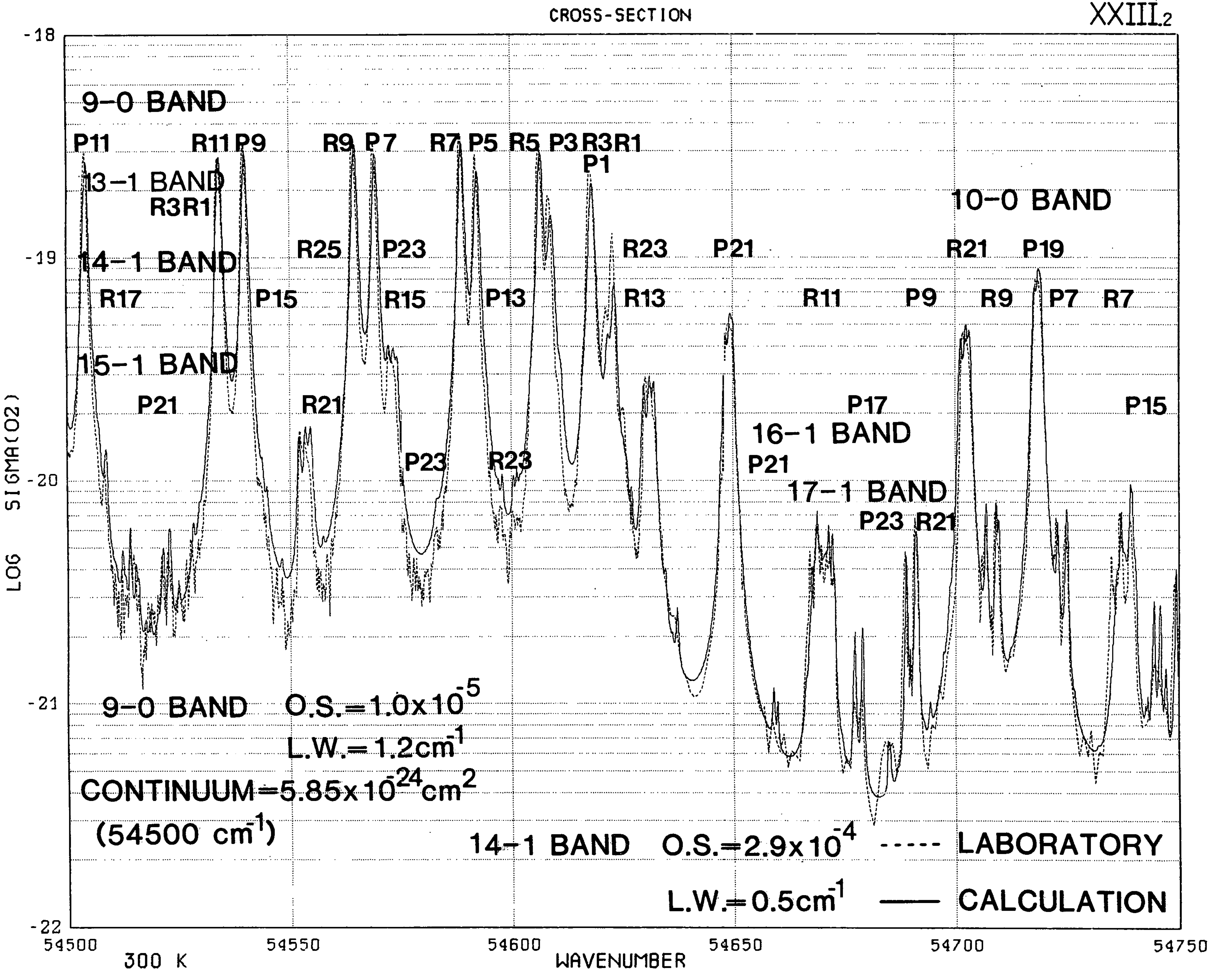
WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54250
54300
54350
54400
54450
54500
210 K
WAVENUMBER

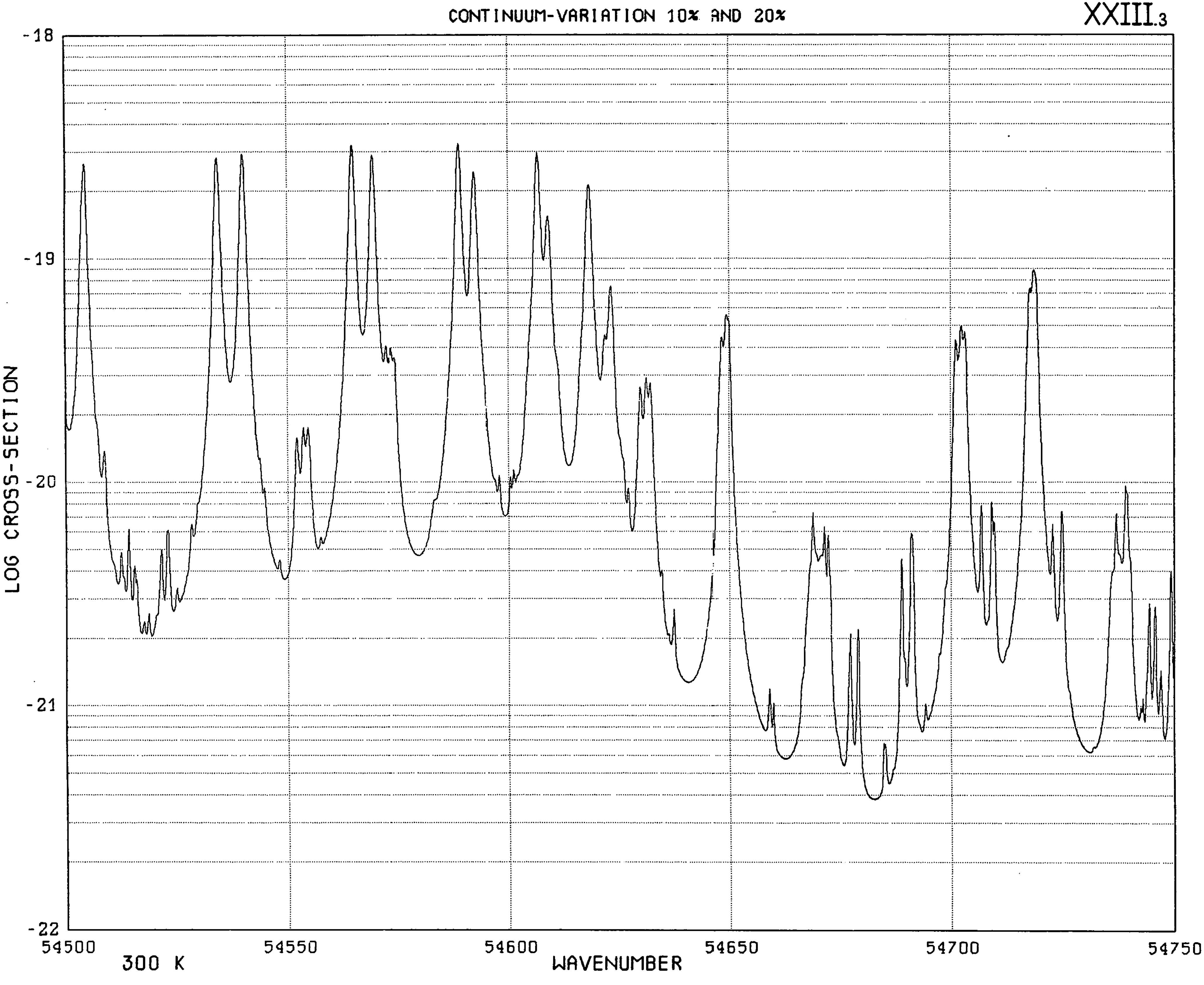

WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54250
54300
54350
54400
54450
54500
190 K
WAVENUMBER

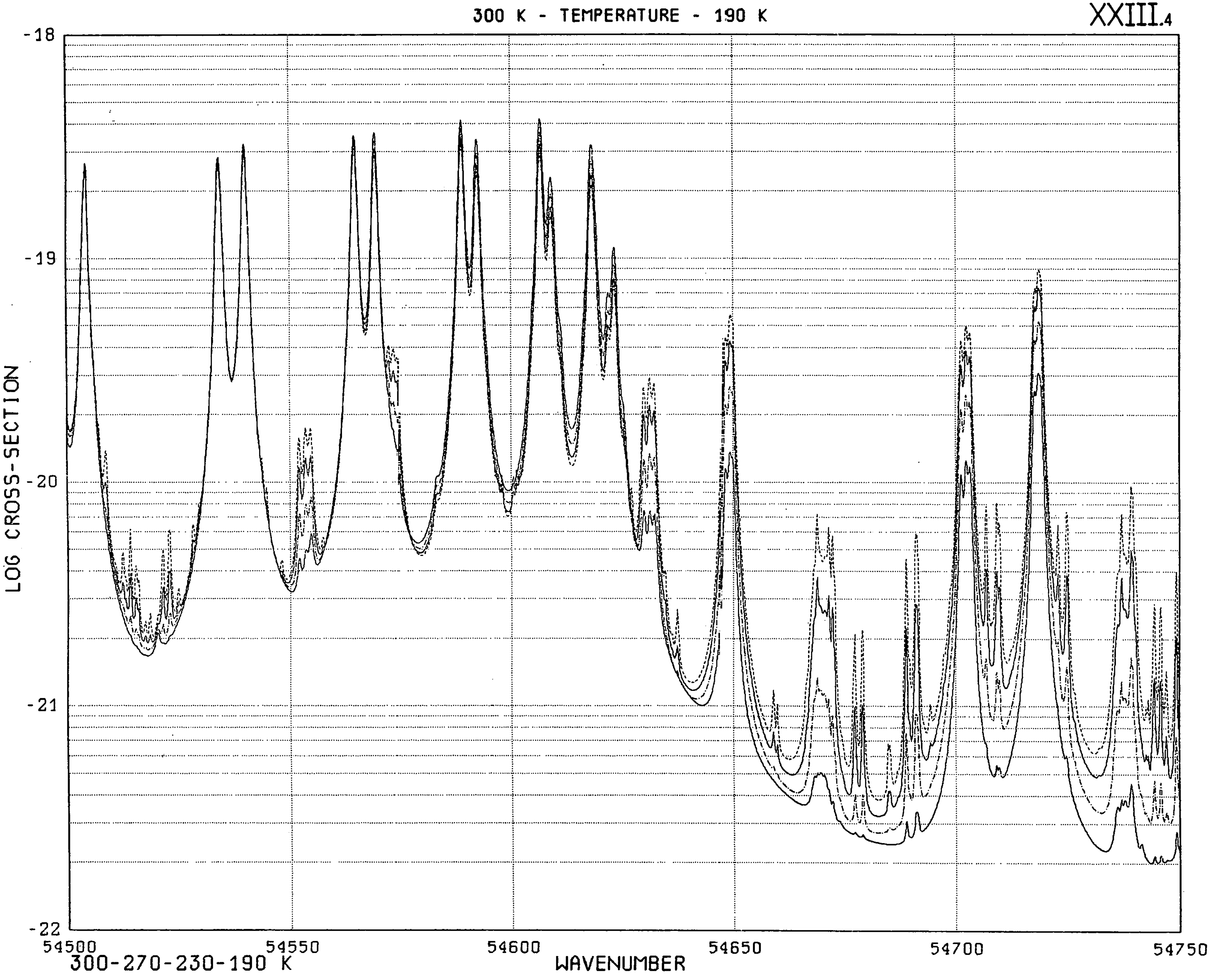
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
54500 - 54750 cm^{-1}

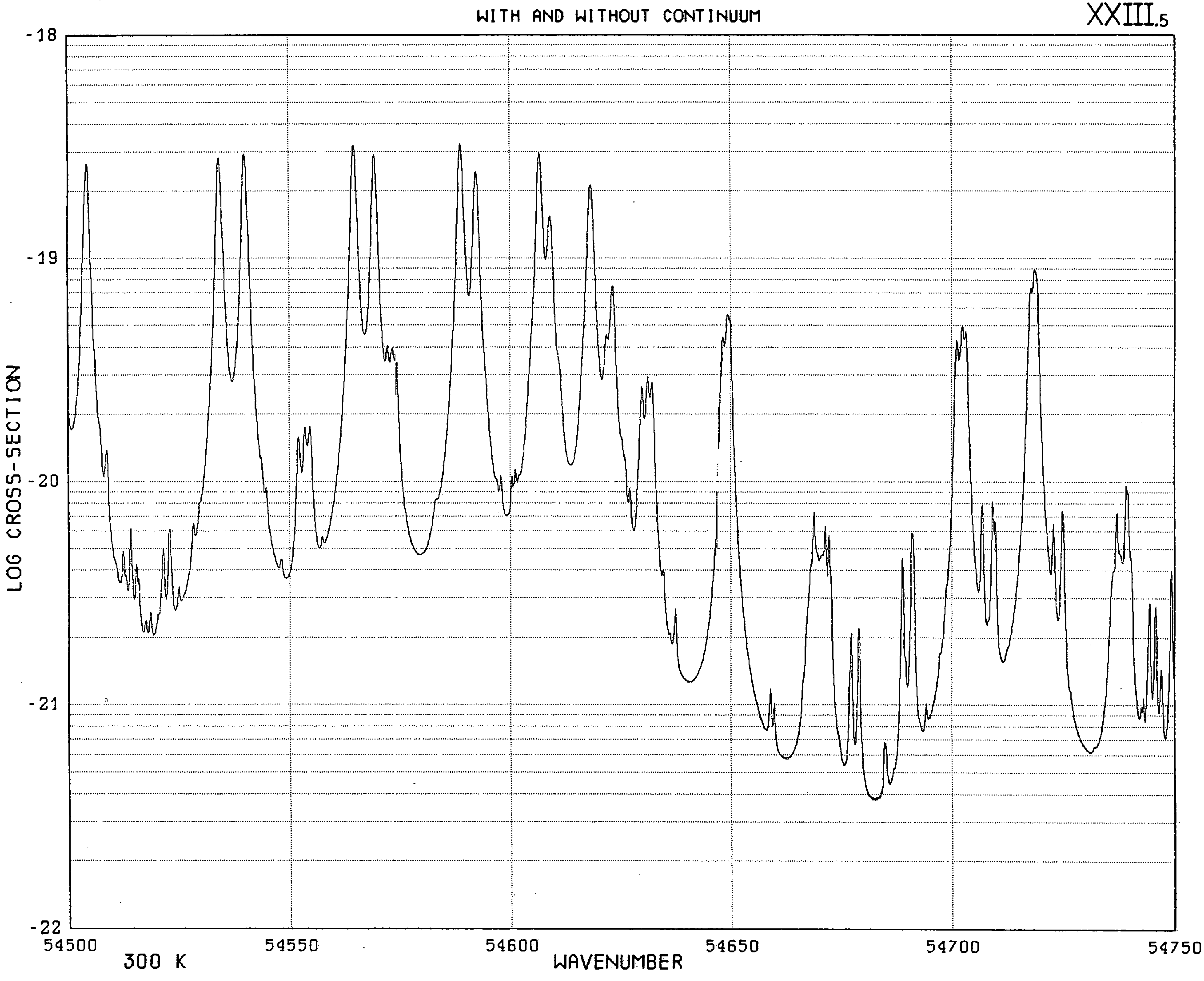
v	λ	band	v	λ	band	v	λ	band	v	λ	band
54500											
54502.2	1834.79	16-1 R25	54557.4	1832.93	15-1 R21	54618.3	1830.89	9-0 R 3	54697.3	1828.24	19-1 P25
54504.1	1834.72	9-0 P11	54562.2	1832.77	16-1 P23	54618.6	1830.88	9-0 R 3	54698.7	1828.20	16-1 R21
54504.4	1834.71	9-0 P11	54564.4	1832.70	9-0 R 9	54619.1	1830.86	9-0 P 1	54700		
54504.5	1834.71	9-0 P11	54564.7	1832.69	9-0 R 9	54621.9	1830.77	9-0 Q 1	54701.2	1828.11	10-0 R21
54507.2	1834.62	13-1 R 5	54564.9	1832.68	9-0 R 9	54623.1	1830.73	9-0 R 1	54701.9	1828.09	15-1 R17
54508.2	1834.59	16-1 R25	54568.3	1832.57	19-1 P27	54623.3	1830.72	14-1 R13	54702.4	1828.07	10-0 R21
54508.6	1834.57	13-1 R 5	54569.1	1832.54	9-0 P 7	54623.5	1830.71	9-0 R 1	54703.1	1828.05	16-1 R21
54508.9	1834.56	13-1 R 5	54569.4	1832.53	9-0 P 7	54625.4	1830.65	18-1 R25	54703.8	1828.03	19-1 R25
54508.9	1834.56	14-1 R17	54569.5	1832.52	9-0 P 7	54625.7	1830.64	18-1 P25	54706.8	1827.93	14-1 R 9
54509.9	1834.53	18-1 P27	54570.0	1832.51	14-1 R15	54626.1	1830.63	14-1 R13	54706.9	1827.92	15-1 R17
54512.4	1834.45	14-1 R17	54571.1	1832.47	16-1 P23	54627.2	1830.59	14-1 R13	54708.2	1827.88	17-1 R23
54513.0	1834.43	15-1 P21	54572.3	1832.43	10-0 P23	54629.1	1830.52	15-1 R19	54709.1	1827.85	15-1 R17
54514.0	1834.39	14-1 R17	54572.9	1832.41	19-1 R27	54631.3	1830.45	10-0 R23	54709.2	1827.85	14-1 R 9
54514.1	1834.39	13-1 P 3	54573.4	1832.39	10-0 P23	54632.3	1830.42	10-0 R23	54709.8	1827.83	14-1 R 9
54515.3	1834.35	13-1 P 3	54574.3	1832.37	10-0 P23	54634.7	1830.34	15-1 R19	54715.2	1827.65	17-1 R23
54515.9	1834.33	13-1 P 3	54574.5	1832.36	14-1 R15	54636.3	1830.29	18-1 P25	54717.7	1827.56	10-0 P19
54518.4	1834.24	15-1 P21	54575.5	1832.32	16-1 P23	54637.4	1830.25	15-1 R19	54718.4	1827.54	19-1 R25
54520.1	1834.19	18-1 R27	54576.3	1832.30	17-1 P25	54647.2	1829.92	14-1 P11	54718.6	1827.53	10-0 P19
54521.1	1834.15	15-1 P21	54585.2	1832.00	17-1 R25	54647.7	1829.90	18-1 R25	54719.2	1827.51	10-0 P19
54521.4	1834.14	13-1 R 3	54588.6	1831.88	9-0 R 7	54648.3	1829.88	10-0 P21	54722.9	1827.39	14-1 P 7
54522.6	1834.10	13-1 R 3	54588.9	1831.88	9-0 R 7	54649.3	1829.85	10-0 P21	54724.4	1827.34	18-1 P23
54523.0	1834.09	13-1 R 3	54589.0	1831.87	9-0 R 7	54650			54724.9	1827.32	14-1 P 7
54524.9	1834.03	13-1 P 1	54589.6	1831.85	19-1 R27	54650.0	1829.83	10-0 P21	54725.1	1827.32	14-1 P 7
54526.9	1833.96	19-1 P27	54592.1	1831.76	9-0 P 5	54659.1	1829.52	16-1 P21	54736.2	1826.94	11-0 R29
54528.0	1833.92	13-1 Q 1	54592.4	1831.76	9-0 P 5	54660.0	1829.49	18-1 R25	54738.0	1826.89	11-0 R29
54528.2	1833.91	13-1 R 1	54592.6	1831.75	9-0 P 5	54666.4	1829.28	17-1 P23	54739.2	1826.84	11-0 R29
54529.5	1833.87	13-1 R 1	54595.1	1831.67	16-1 R23	54667.3	1829.25	16-1 P21	54739.3	1826.84	14-1 R 7
54534.0	1833.72	9-0 R11	54597.0	1831.60	15-1 P19	54668.1	1829.22	11-0 P29	54739.7	1826.83	14-1 R 7
54534.2	1833.71	18-1 R27	54597.9	1831.57	14-1 P13	54668.9	1829.19	14-1 R11	54740.4	1826.81	15-1 P15
54534.3	1833.71	9-0 R11	54600			54669.6	1829.17	11-0 P29	54743.2	1826.71	18-1 P23
54534.5	1833.70	9-0 R11	54600.2	1831.49	17-1 R25	54670.6	1829.14	11-0 P29	54744.0	1826.68	18-1 R23
54539.8	1833.52	9-0 P 9	54600.4	1831.49	14-1 P13	54670.9	1829.13	16-1 P21	54744.5	1826.67	15-1 P15
54540.0	1833.52	9-0 P 9	54601.2	1831.46	14-1 P13	54671.5	1829.11	14-1 R11	54745.9	1826.62	15-1 P15
54540.2	1833.51	9-0 P 9	54602.0	1831.44	15-1 P19	54672.3	1829.08	14-1 R11	54747.1	1826.58	16-1 P19
54541.0	1833.48	14-1 P15	54604.1	1831.36	15-1 P19	54672.7	1829.07	15-1 P17	54749.4	1826.50	14-1 P 5
54543.8	1833.39	14-1 P15	54604.9	1831.34	16-1 R23	54676.8	1828.93	19-1 R25			
54543.8	1833.39	19-1 R27	54605.3	1831.32	18-1 P25	54677.3	1828.91	15-1 P17			
54544.8	1833.36	14-1 P15	54606.5	1831.29	9-0 R 5	54679.0	1828.85	15-1 P17			
54548.1	1833.24	15-1 R21	54606.7	1831.28	9-0 R 5	54679.2	1828.85	17-1 P23			
54550			54606.9	1831.27	9-0 R 5	54684.7	1828.66	19-1 P25			
54552.1	1833.11	10-0 R25	54608.3	1831.22	17-1 R25	54685.1	1828.65	17-1 P23			
54553.5	1833.06	10-0 R25	54608.9	1831.21	9-0 P 3	54688.9	1828.53	14-1 P 9			
54553.8	1833.05	19-1 P27	54609.2	1831.20	9-0 P 3	54689.6	1828.50	16-1 R21			
54554.2	1833.04	15-1 R21	54609.6	1831.18	9-0 P 3	54691.0	1828.46	14-1 P 9			
54554.7	1833.02	10-0 R25	54610.1	1831.16	16-1 R23	54691.3	1828.44	14-1 P 9			
54555.6	1832.99	17-1 P25	54618.0	1830.90	9-0 R 3	54694.3	1828.35	17-1 R23			

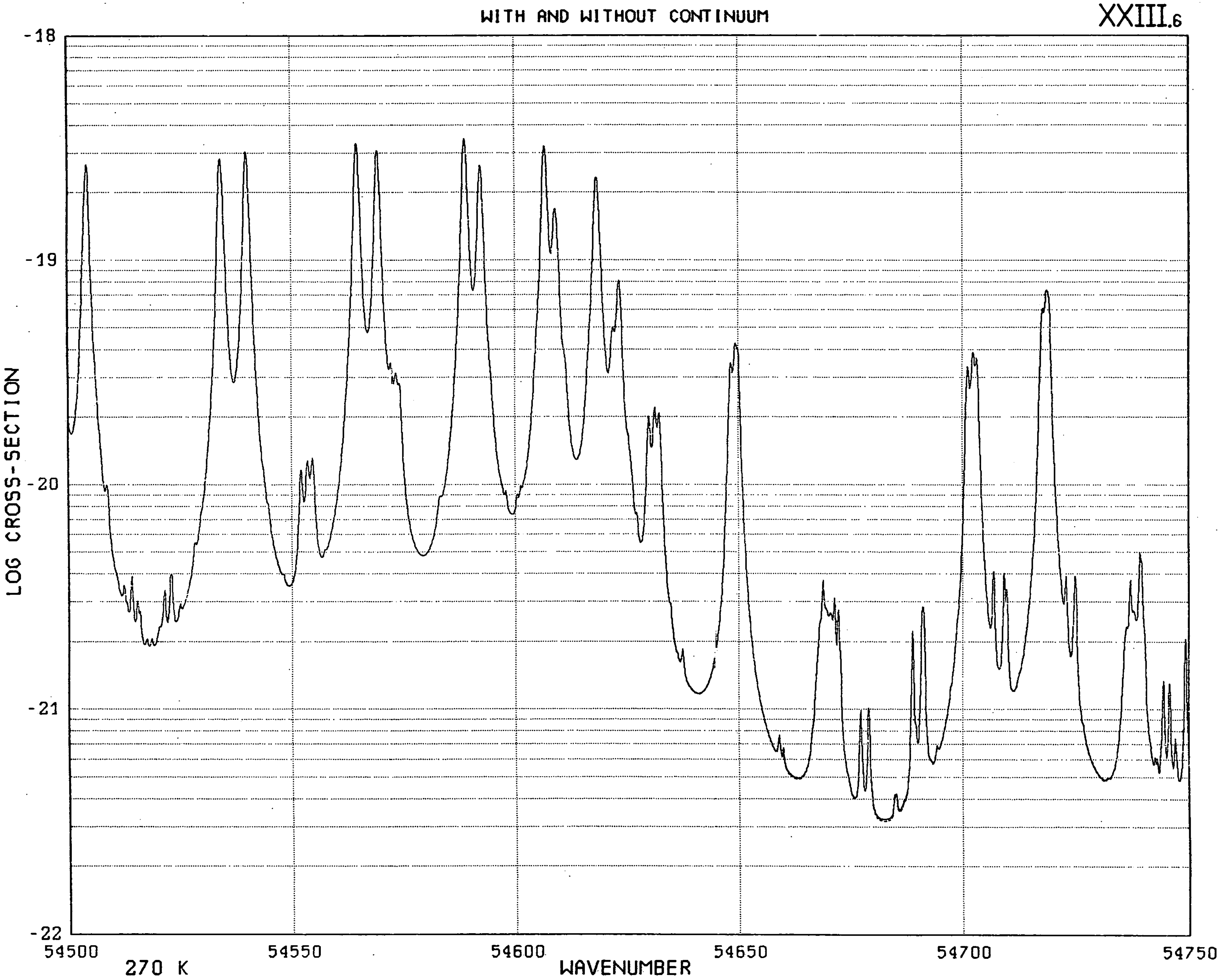

IDENTIFICATION
300K
LABORATORY
CALCULATION
9–0 BAND
P11
R11 P9
R9 P7
R7 P5
R5 P3
R3 R1
P1
R25
R23
P21
10–0 BAND
R21
P19
14–1 BAND
R17
P15
R15
R11
P9
R9
P7
R7
13–1 BAND
R3
15–1 BAND
P17
CROSS-SECTION
4
3
2
1.10⁻¹⁹
0
WAVENUMBER
54500
54550
54600
54650
54700
54750

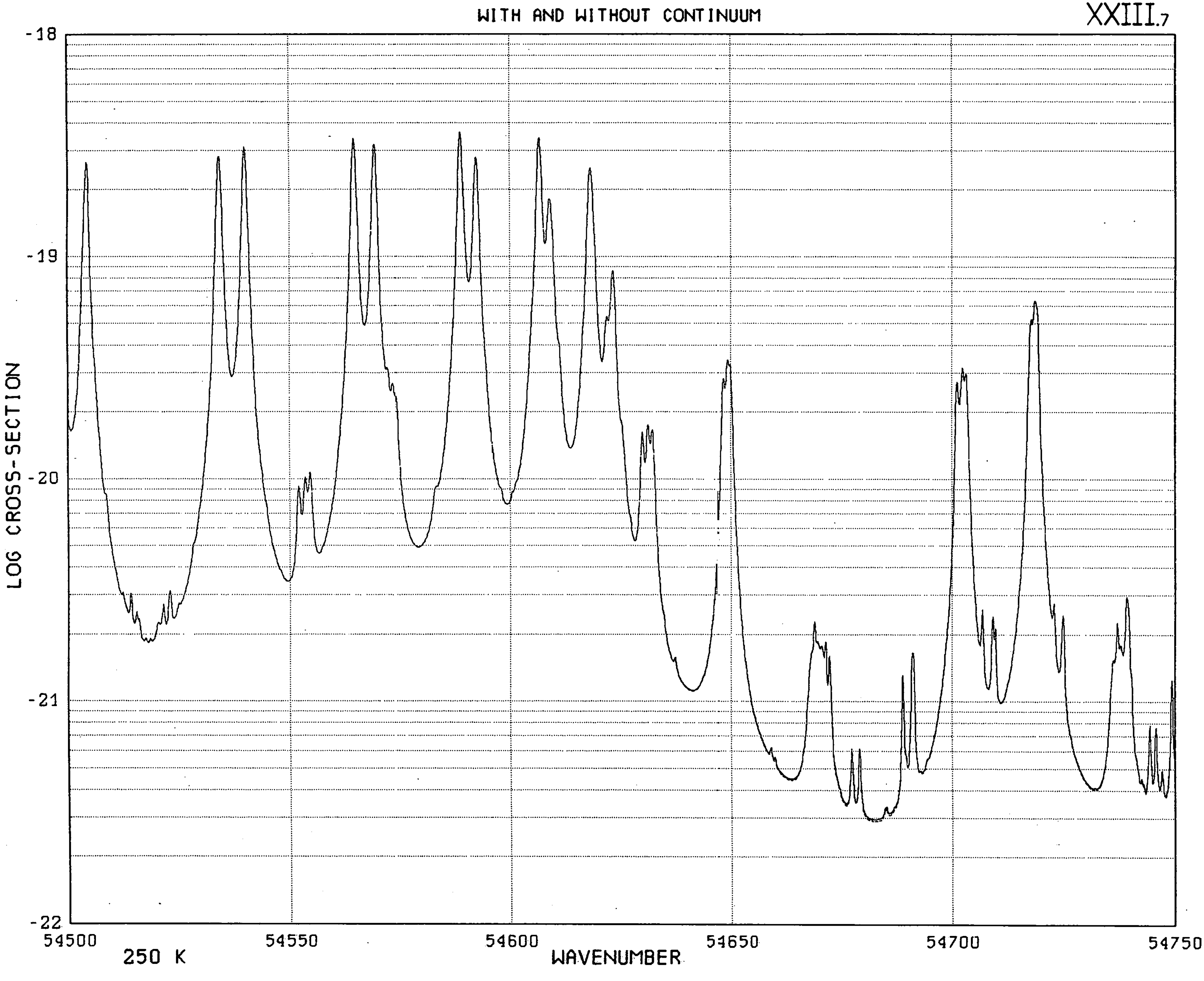

CROSS-SECTION
-18
-19
-20
-21
-22
LOG SIGMA(O2)
9-0 BAND
P11
R11 P9
R9 P7
R7 P5 R5 P3 R3 R1
P1
13-1 BAND
R3 R1
14-1 BAND
R17
P15
R25
P23
R15
P13
R23
R13
P21
15-1 BAND
P21
R21
P23
R23
10-0 BAND
R21
P19
R11
P9
R9
P7
R7
P17
P15
16-1 BAND
P21
17-1 BAND
P23 R21
9-0 BAND O.S.=1.0x10-5
L.W.=1.2cm-1
CONTINUUM=5.85x10-24cm2
(54500 cm-1)
14-1 BAND O.S.=2.9x10-4
L.W.=0.5cm-1
LABORATORY
CALCULATION
54500
54550
54600
54650
54700
54750
300 K
WAVENUMBER


CONTINUUM-VARIATION 10% AND 20%
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54500
54550
54600
54650
54700
54750
300 K
WAVENUMBER

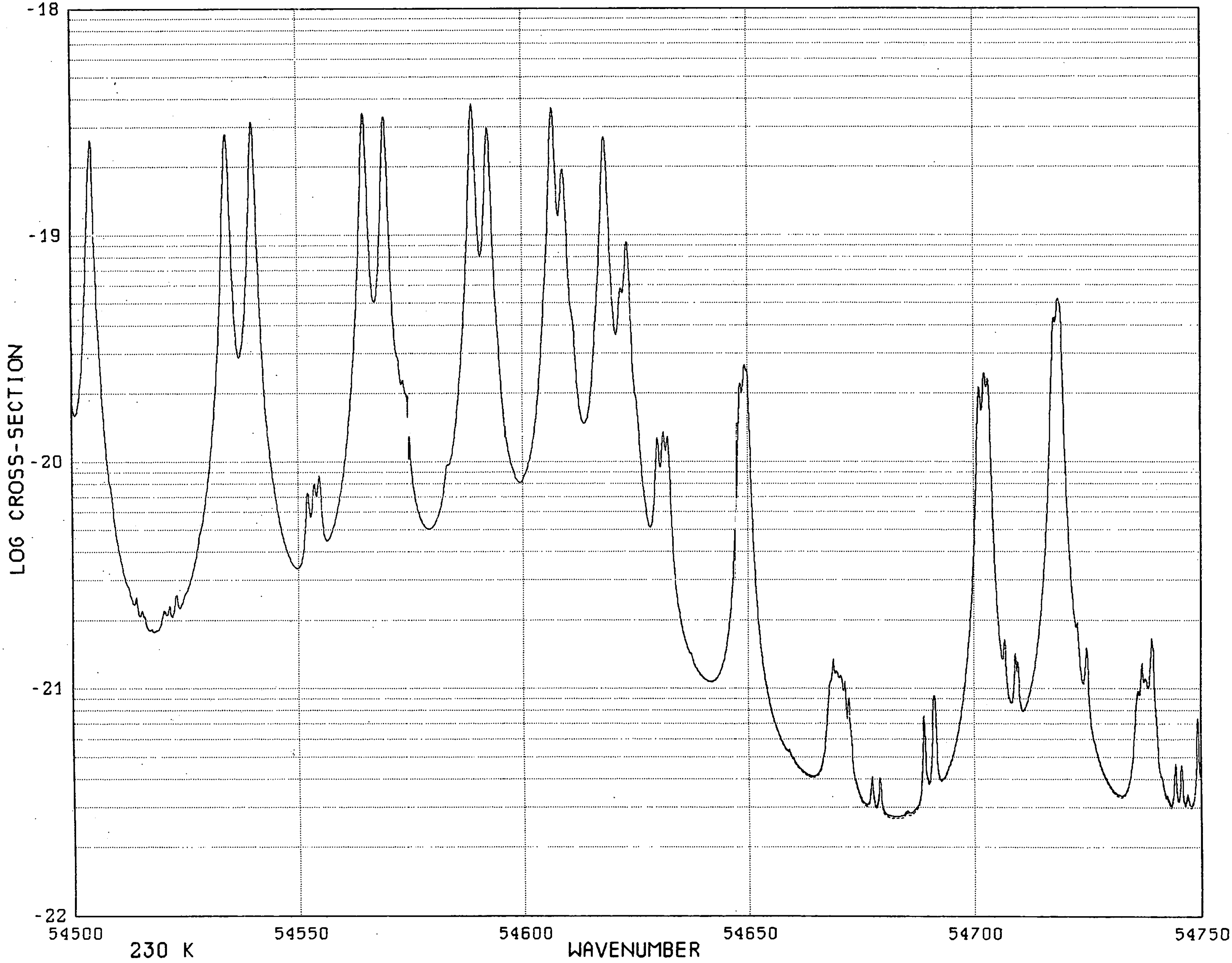

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54500
54550
54600
54650
54700
54750
WAVENUMBER
300-270-230-190 K

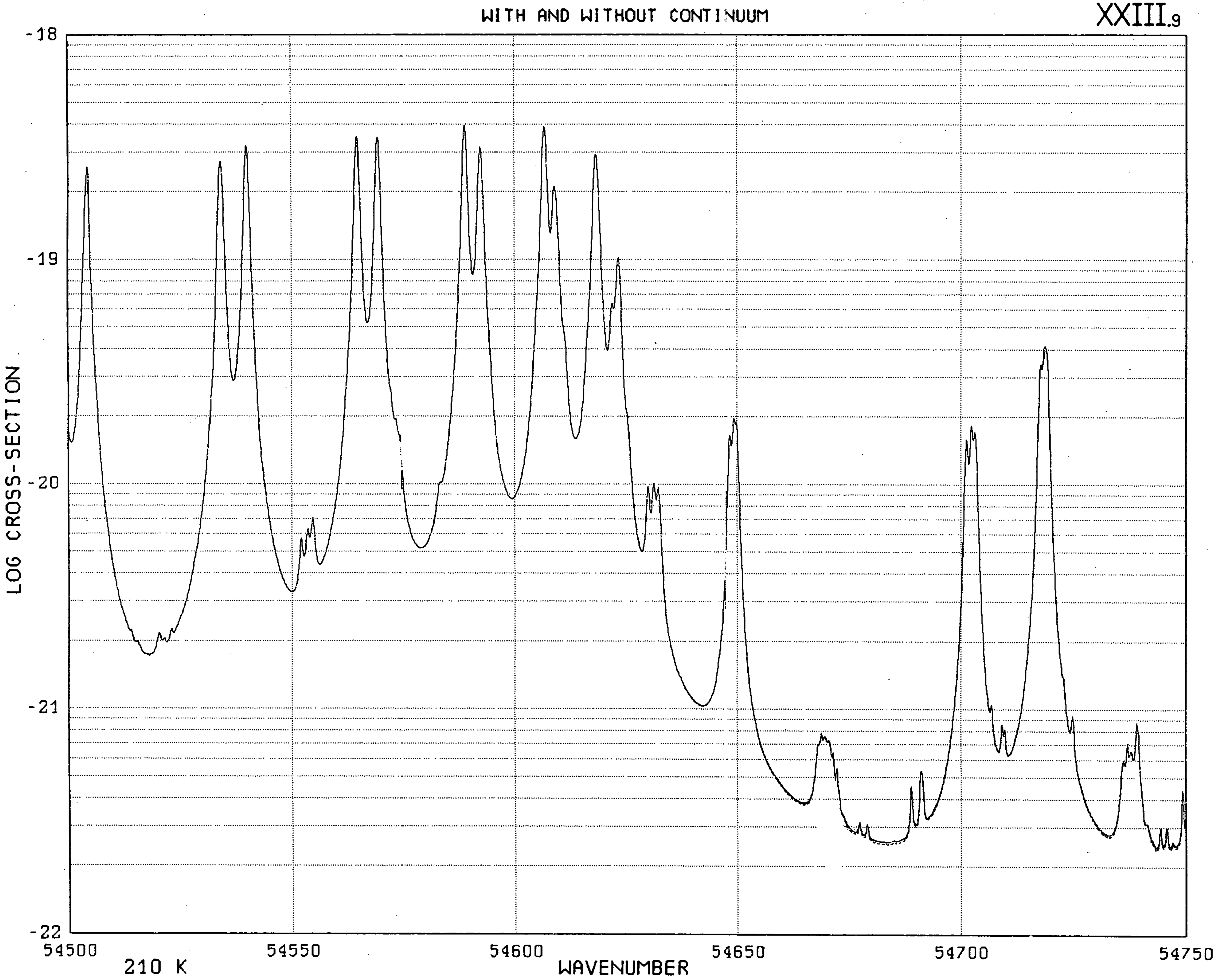

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54500
54550
54600
54650
54700
54750
300 K
WAVENUMBER

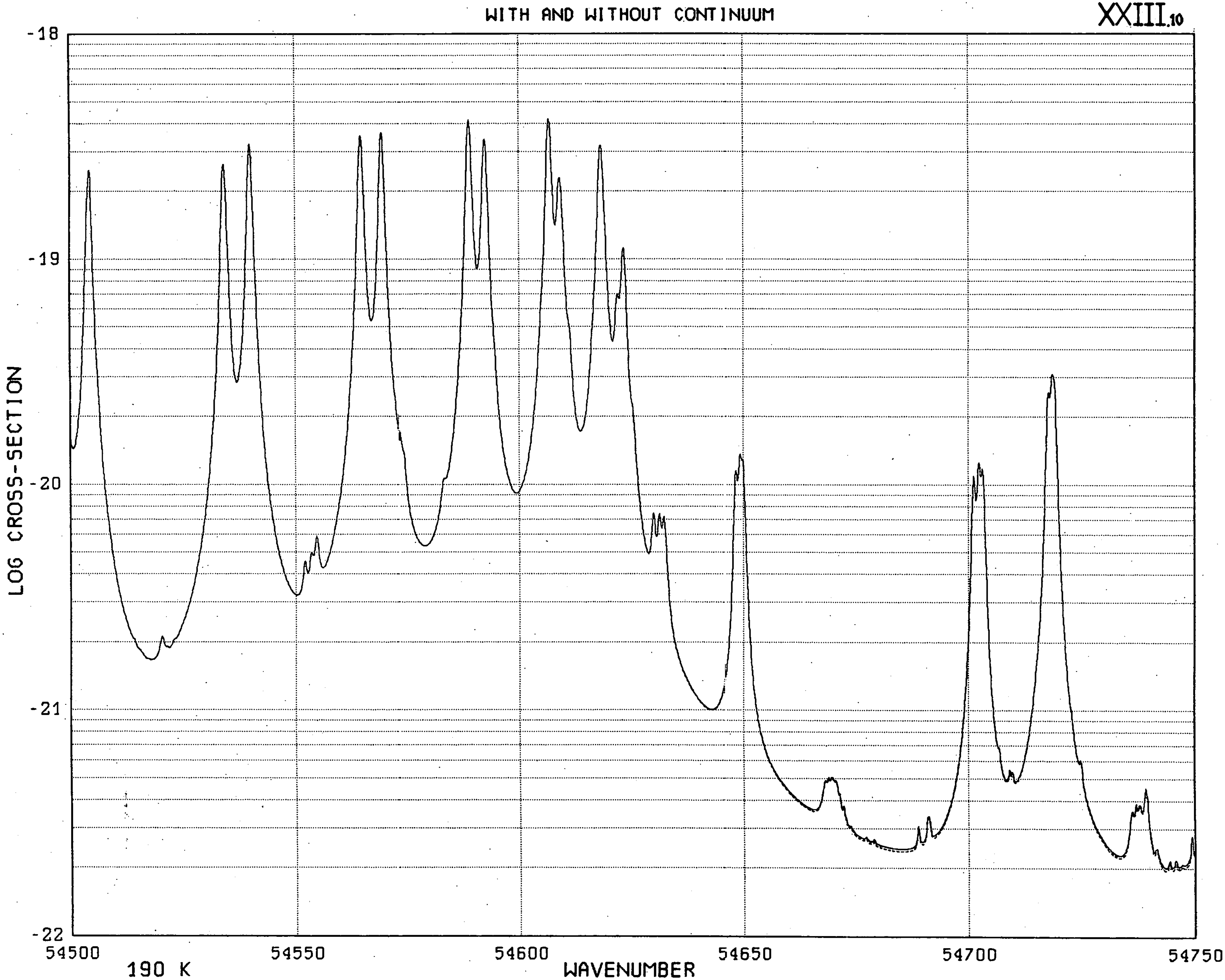

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54500
54550
54600
54650
54700
54750
WAVENUMBER
270 K


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54500
54550
54600
54650
54700
54750
250 K
WAVENUMBER

WITH AND WITHOUT CONTINUUM

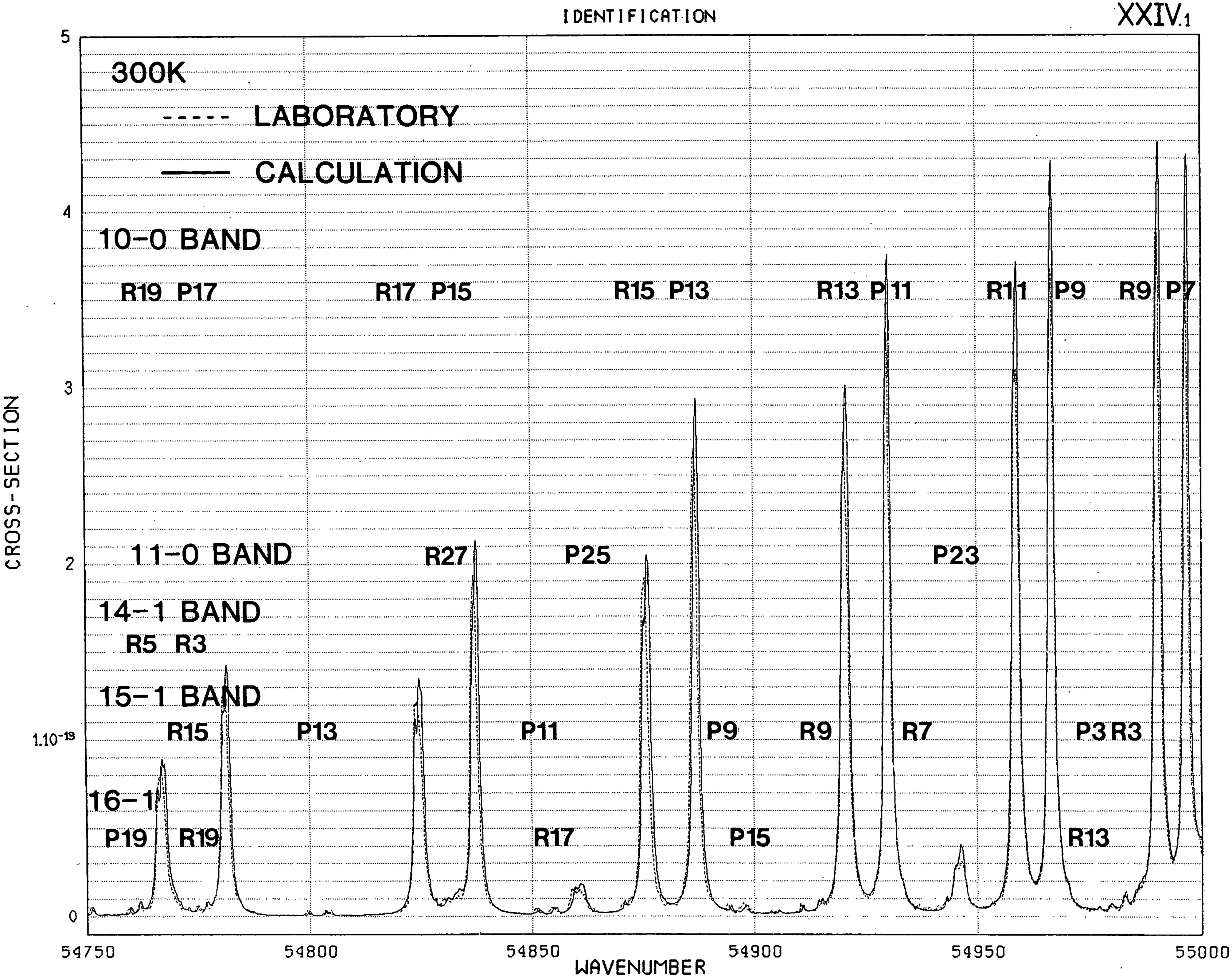


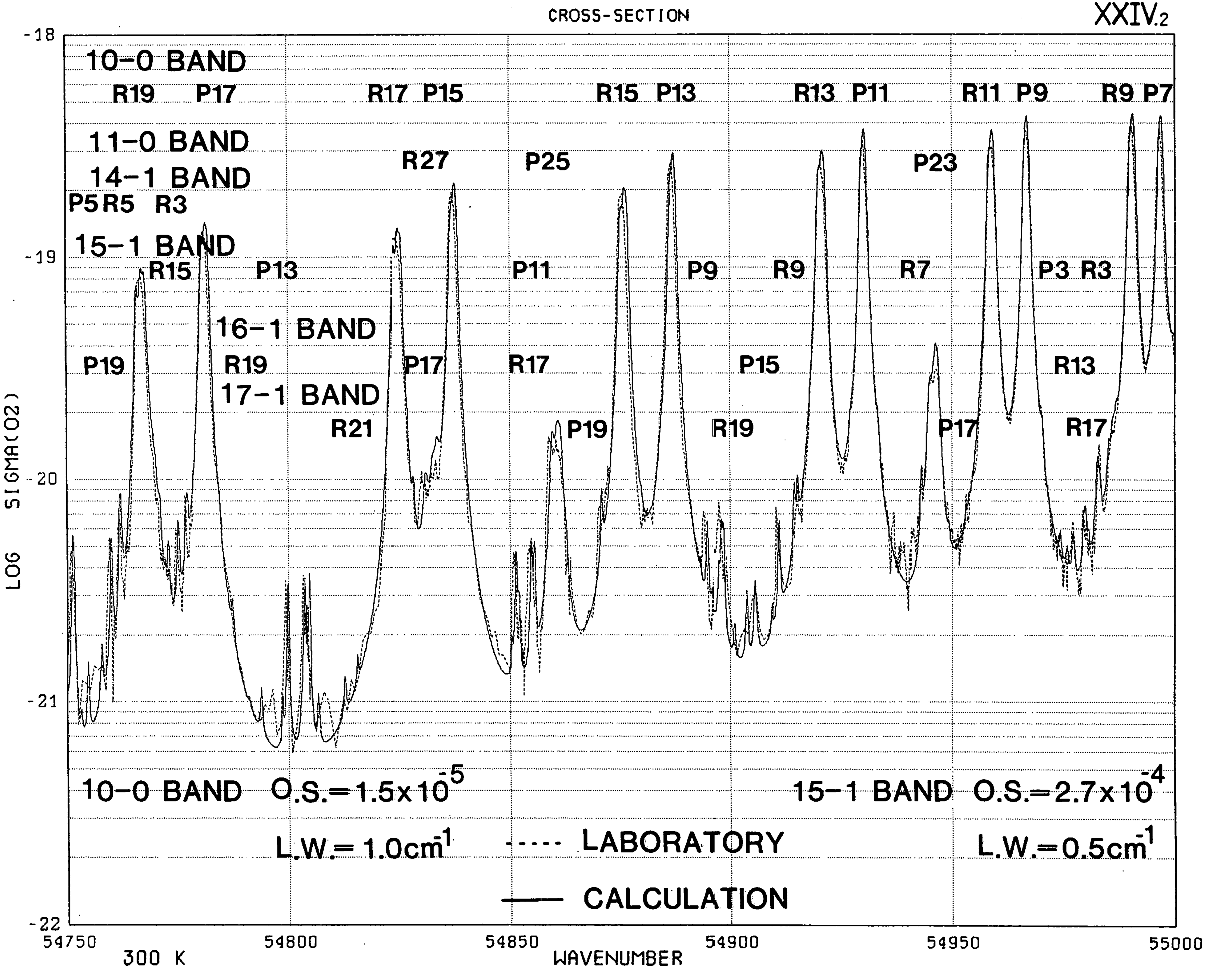

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54500
54550
54600
54650
54700
54750
210 K
WAVENUMBER

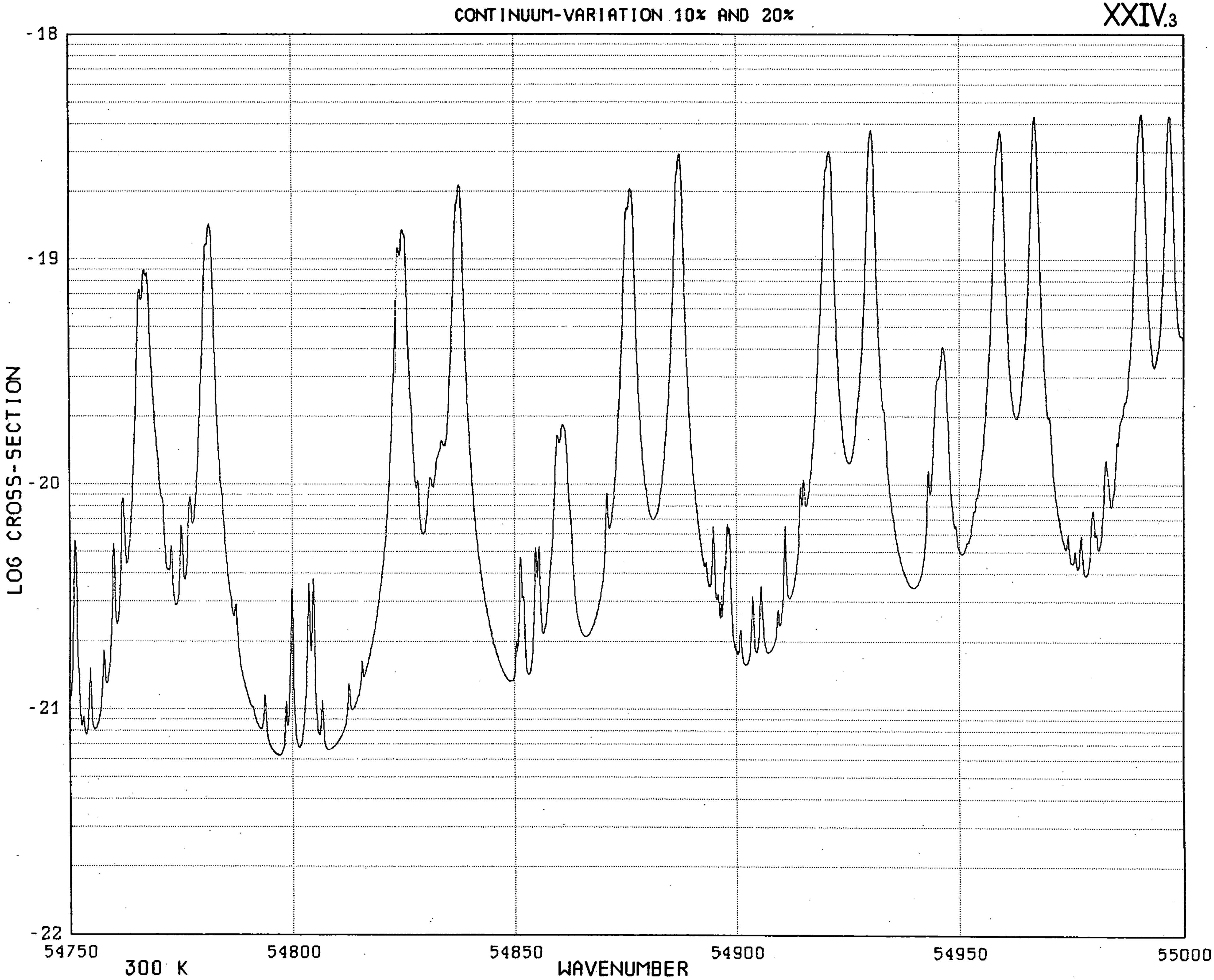

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54500
54550
54600
54650
54700
54750
190 K
WAVENUMBER

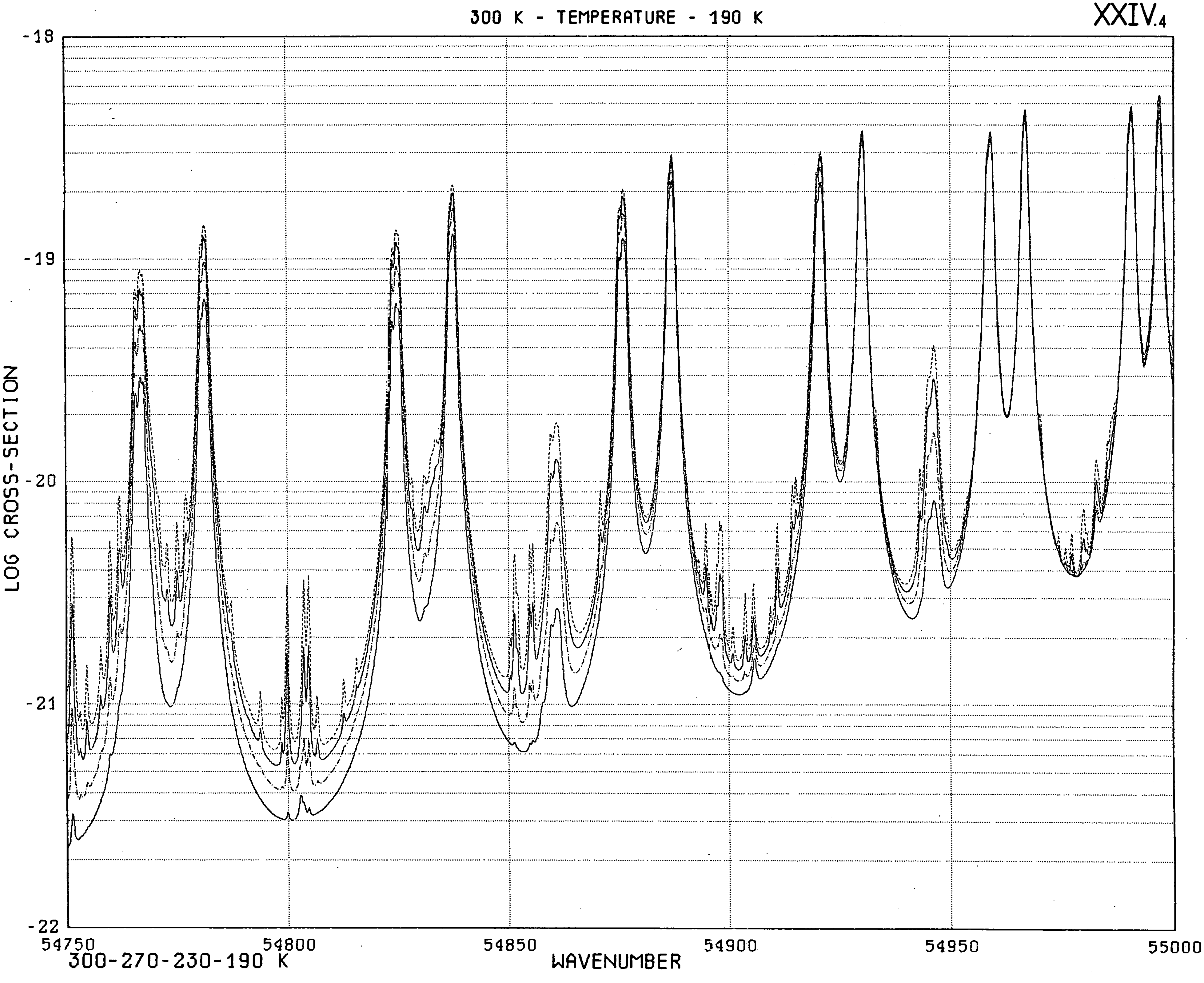
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
54750 - 55000 cm^{-1}

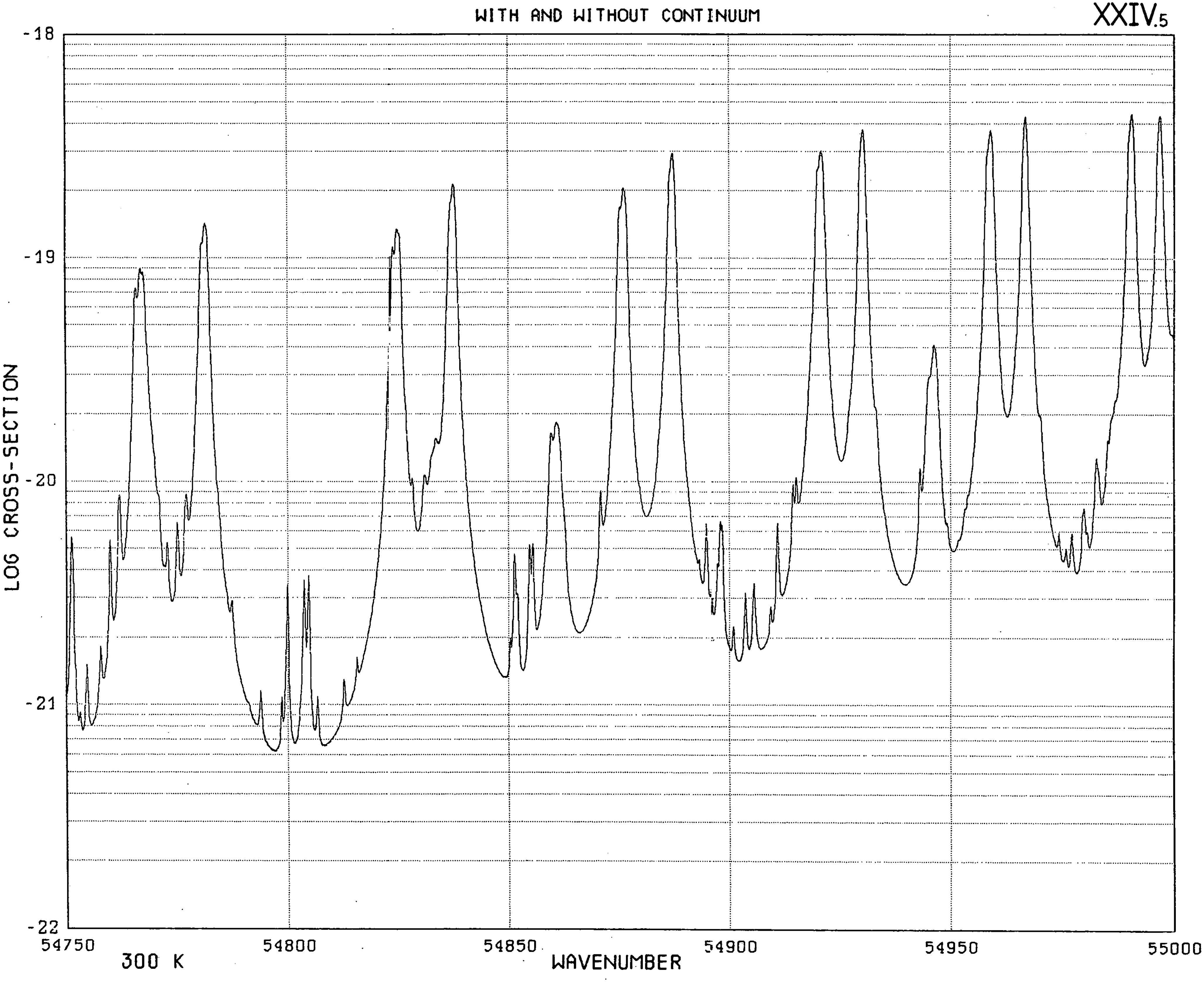
ν	λ	band	ν	λ	band	ν	λ	band	ν	λ	band
54750											
54751.2	1826.44	14-1 P 5	54815.6	1824.30	19-1 P23	54887.5	1821.91	10-0 P13	54958.3	1819.56	10-0 R11
54751.5	1826.43	14-1 P 5	54822.7	1824.06	15-1 R13	54893.2	1821.72	19-1 P21	54958.9	1819.54	10-0 R11
54754.7	1826.33	16-1 P19	54823.5	1824.04	19-1 R23	54894.8	1821.67	15-1 P 9	54959.4	1819.53	10-0 R11
54757.7	1826.23	16-1 P19	54823.8	1824.03	10-0 R17	54895.9	1821.63	17-1 R19	54959.6	1819.52	16-1 P13
54759.9	1826.15	14-1 R 5	54824.7	1823.99	10-0 R17	54897.3	1821.58	16-1 P15	54960.5	1819.49	15-1 P 5
54761.8	1826.09	14-1 R 5	54825.4	1823.97	10-0 R17	54898.0	1821.56	15-1 P 9	54960.8	1819.48	15-1 P 5
54762.1	1826.08	14-1 R 5	54826.5	1823.93	16-1 P17	54898.4	1821.55	15-1 P 9	54964.9	1819.34	17-1 R17
54764.5	1826.00	18-1 R23	54826.9	1823.92	15-1 R13	54900			54965.4	1819.33	16-1 P13
54765.8	1825.96	10-0 R19	54828.3	1823.88	15-1 R13	54901.0	1821.46	17-1 R19	54966.3	1819.29	10-0 P 9
54766.4	1825.94	15-1 R15	54831.0	1823.79	11-0 R27	54903.7	1821.37	16-1 P15	54966.7	1819.29	18-1 R19
54766.9	1825.92	10-0 R19	54832.6	1823.73	11-0 R27	54905.5	1821.31	16-1 P15	54966.8	1819.28	16-1 P13
54767.3	1825.91	11-0 P27	54833.1	1823.72	18-1 P21	54909.4	1821.18	19-1 R21	54966.9	1819.28	10-0 P 9
54767.6	1825.90	10-0 R19	54833.5	1823.70	16-1 P17	54914.4	1821.02	19-1 P21	54967.1	1819.27	10-0 P 9
54767.8	1825.89	17-1 P21	54833.7	1823.70	11-0 R27	54914.5	1821.01	15-1 R 9	54967.2	1819.27	15-1 R 5
54768.2	1825.88	14-1 P 3	54835.9	1823.62	16-1 P17	54915.2	1820.99	15-1 R 9	54970.1	1819.17	15-1 R 5
54768.6	1825.86	11-0 P27	54836.1	1823.62	19-1 R23	54918.9	1820.87	11-0 R25	54970.5	1819.16	15-1 R 5
54769.5	1825.83	11-0 P27	54836.8	1823.59	10-0 P15	54920.0	1820.83	10-0 R13	54974.3	1819.03	18-1 R19
54770.0	1825.82	14-1 P 3	54837.5	1823.57	10-0 P15	54920.3	1820.82	11-0 R25	54975.9	1818.98	17-1 R17
54770.7	1825.79	14-1 P 3	54837.9	1823.55	10-0 P15	54920.8	1820.80	10-0 R13	54977.2	1818.93	15-1 P 3
54771.0	1825.79	15-1 R15	54850			54921.2	1820.79	10-0 R13	54979.6	1818.85	16-1 R13
54772.8	1825.73	15-1 R15	54850.4	1823.14	18-1 P21	54923.5	1820.72	19-1 P21	54980.0	1818.84	15-1 P 3
54775.0	1825.65	14-1 R 3	54851.3	1823.11	15-1 P11	54927.1	1820.59	16-1 R15	54980.1	1818.84	17-1 R17
54775.1	1825.65	18-1 R23	54851.8	1823.09	18-1 R21	54929.6	1820.51	16-1 R15	54980.7	1818.82	15-1 P 3
54775.3	1825.64	16-1 R19	54852.1	1823.09	16-1 R17	54929.7	1820.51	10-0 P11	54982.8	1818.75	12-0 P29
54776.8	1825.59	14-1 R 3	54854.8	1822.99	15-1 P11	54930.3	1820.49	10-0 P11	54983.3	1818.73	15-1 R 3
54777.1	1825.58	14-1 R 3	54855.5	1822.97	15-1 P11	54930.3	1820.49	15-1 P 7	54985.3	1818.67	12-0 P29
54779.2	1825.51	14-1 P 1	54858.0	1822.89	18-1 P21	54930.6	1820.48	10-0 P11	54986.0	1818.64	16-1 R13
54779.6	1825.50	17-1 P21	54859.6	1822.84	11-0 P25	54931.6	1820.45	18-1 P19	54986.1	1818.64	15-1 R 3
54780.5	1825.47	10-0 P17	54859.7	1822.83	16-1 R17	54932.4	1820.42	19-1 R21	54986.5	1818.63	15-1 R 3
54781.3	1825.44	10-0 P17	54860.0	1822.82	17-1 P19	54933.2	1820.39	15-1 P 7	54987.0	1818.61	12-0 P29
54781.8	1825.42	10-0 P17	54860.8	1822.79	11-0 P25	54933.5	1820.38	15-1 P 7	54987.9	1818.58	16-1 R13
54781.9	1825.42	19-1 P23	54861.6	1822.77	11-0 P25	54943.0	1820.07	17-1 P17	54988.4	1818.57	15-1 P 1
54782.4	1825.40	14-1 R 1	54862.7	1822.73	16-1 R17	54943.1	1820.07	15-1 R 7	54990.0	1818.51	10-0 R 9
54782.8	1825.39	14-1 Q 1	54870.7	1822.47	18-1 R21	54943.2	1820.06	19-1 R21	54990.6	1818.49	10-0 R 9
54783.6	1825.37	16-1 R19	54870.9	1822.46	15-1 R11	54945.0	1820.00	11-0 P23	54990.9	1818.48	10-0 R 9
54784.6	1825.33	17-1 P21	54870.9	1822.46	17-1 P19	54946.1	1819.97	11-0 P23	54991.4	1818.47	15-1 R 1
54787.3	1825.24	16-1 R19	54874.7	1822.33	15-1 R11	54946.3	1819.96	15-1 R 7	54992.8	1818.42	15-1 Q 1
54793.8	1825.02	17-1 R21	54875.1	1822.32	17-1 P19	54946.8	1819.94	11-0 P23	54994.0	1818.38	19-1 P19
54798.6	1824.86	19-1 R23	54875.2	1822.32	10-0 R15	54946.8	1819.94	15-1 R 7	54994.2	1818.37	15-1 R 1
54799.9	1824.82	15-1 P13	54875.7	1822.30	15-1 R11	54947.5	1819.92	18-1 P19	54996.5	1818.30	10-0 P 7
54800			54876.0	1822.29	10-0 R15	54949.3	1819.86	18-1 R19	54997.0	1818.28	10-0 P 7
54803.6	1824.70	15-1 P13	54876.6	1822.27	10-0 R15	54950			54997.2	1818.27	10-0 P 7
54804.7	1824.66	15-1 P13	54879.8	1822.16	18-1 R21	54953.1	1819.73	17-1 P17	54999.8	1818.19	11-0 R23
54804.8	1824.66	19-1 P23	54884.0	1822.02	17-1 R19	54953.8	1819.71	18-1 P19			
54806.7	1824.59	17-1 R21	54886.5	1821.94	10-0 P13	54956.5	1819.62	17-1 P17			
54812.7	1824.39	17-1 R21	54887.1	1821.92	10-0 P13	54957.8	1819.58	15-1 P 5			

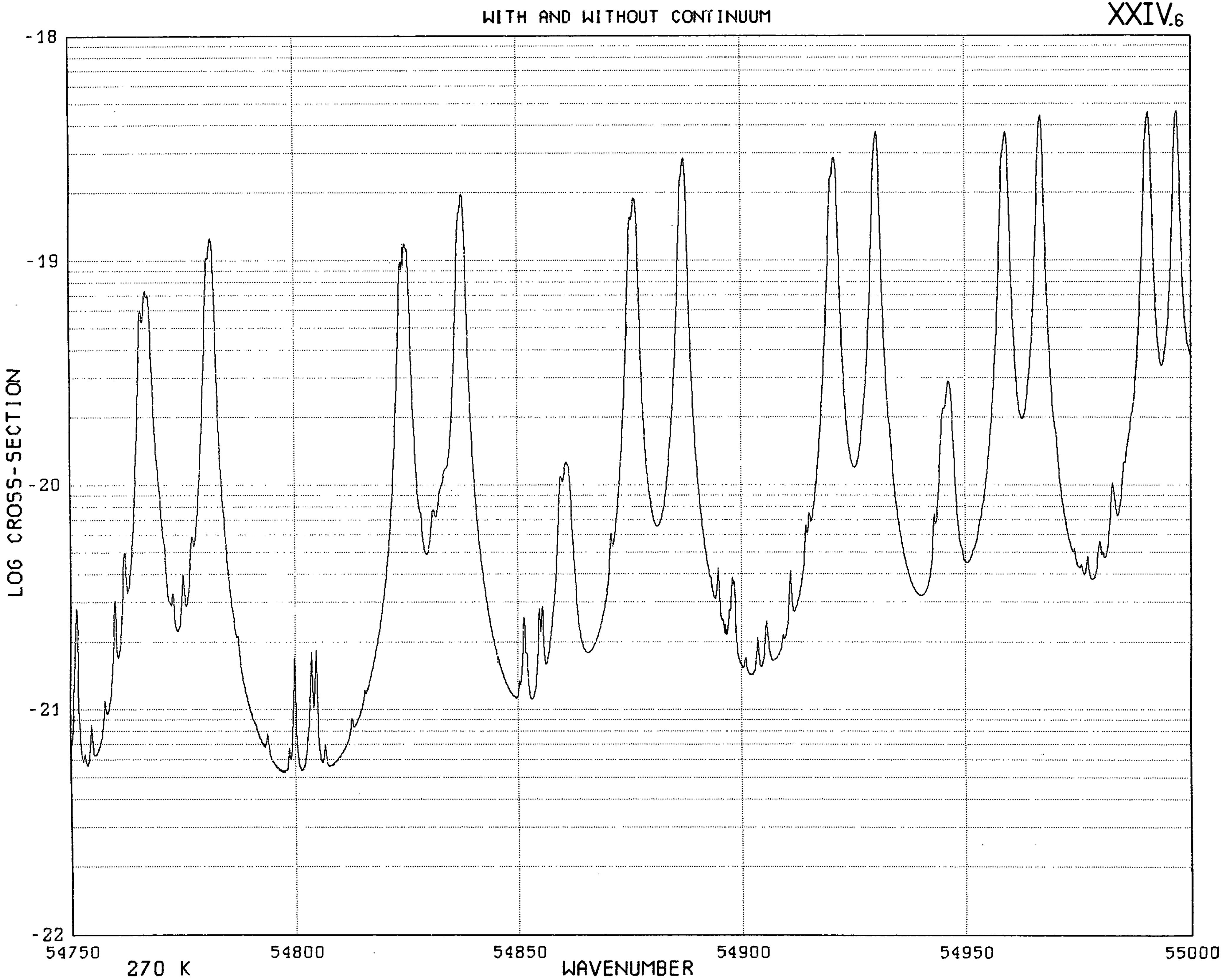

IDENTIFICATION
300K
LABORATORY
CALCULATION
10–0 BAND
R19 P17
R17 P15
R15 P13
R13 P11
R11 P9
R9 P7
11–0 BAND
R27
P25
P23
14–1 BAND
R5 R3
15–1 BAND
R15
P13
P11
P9
R9
R7
P3 R3
16–1
P19 R19
R17
P15
R13
CROSS-SECTION
5
4
3
2
1.10⁻¹⁹
0
54750
54800
54850
54900
54950
55000
WAVENUMBER

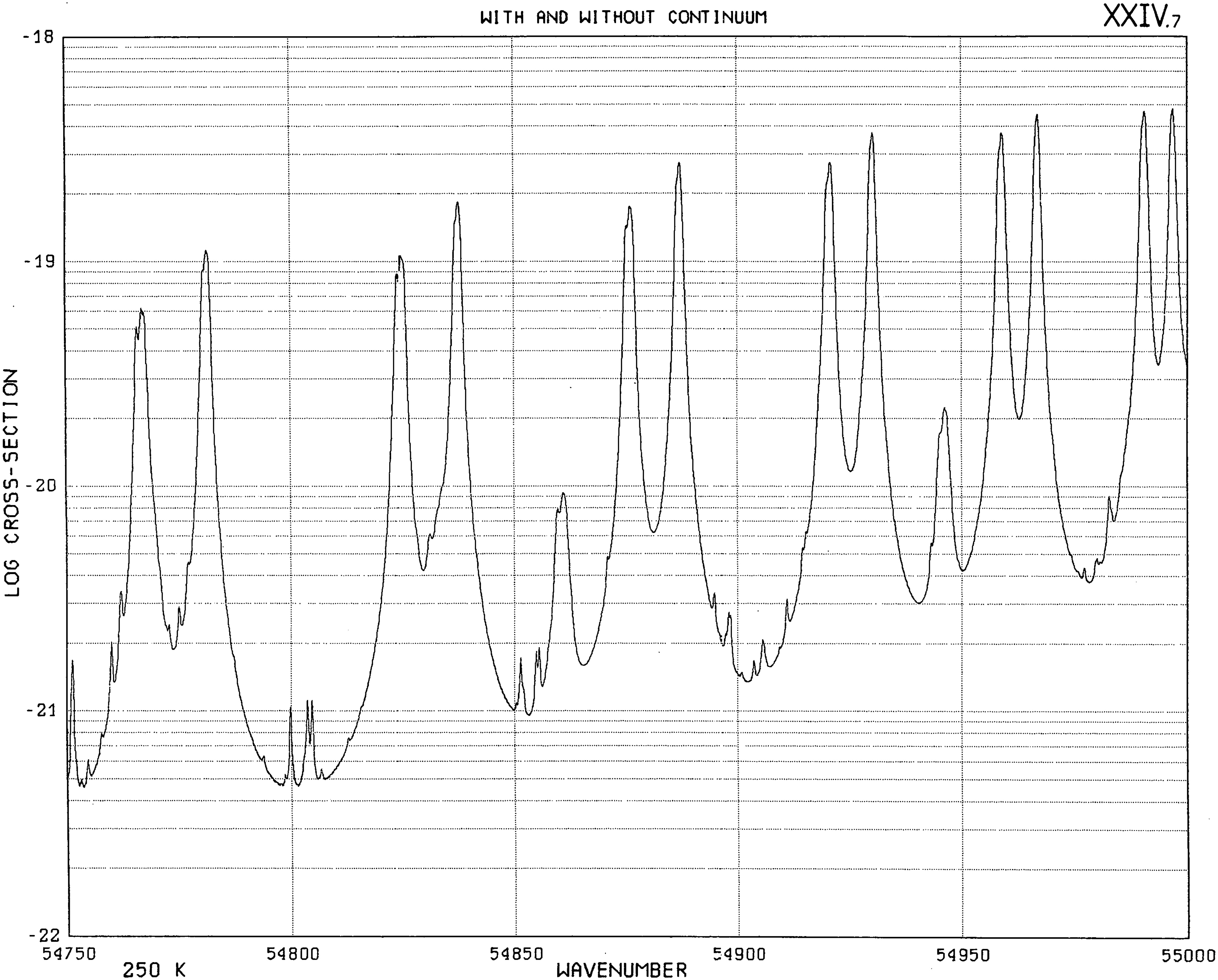

CROSS-SECTION
10–0 BAND
R19 P17 R17 P15 R15 P13 R13 P11 R11 P9 R9 P7
11–0 BAND
14–1 BAND
R27 P25 P23
P5 R5 R3
15–1 BAND
R15 P13 P11 P9 R9 R7 P3 R3
16–1 BAND
P19 R19 P17 R17 P15 R13
17–1 BAND
R21 P19 R19 P17 R17
-18
-19
-20
-21
-22
LOG SIGMA(O2)
10–0 BAND O.S.=1.5x10⁻⁵
L.W.=1.0cm⁻¹
15–1 BAND O.S.=2.7x10⁻⁴
L.W.=0.5cm⁻¹
LABORATORY
CALCULATION
54750
54800
54850
54900
54950
55000
300 K
WAVENUMBER

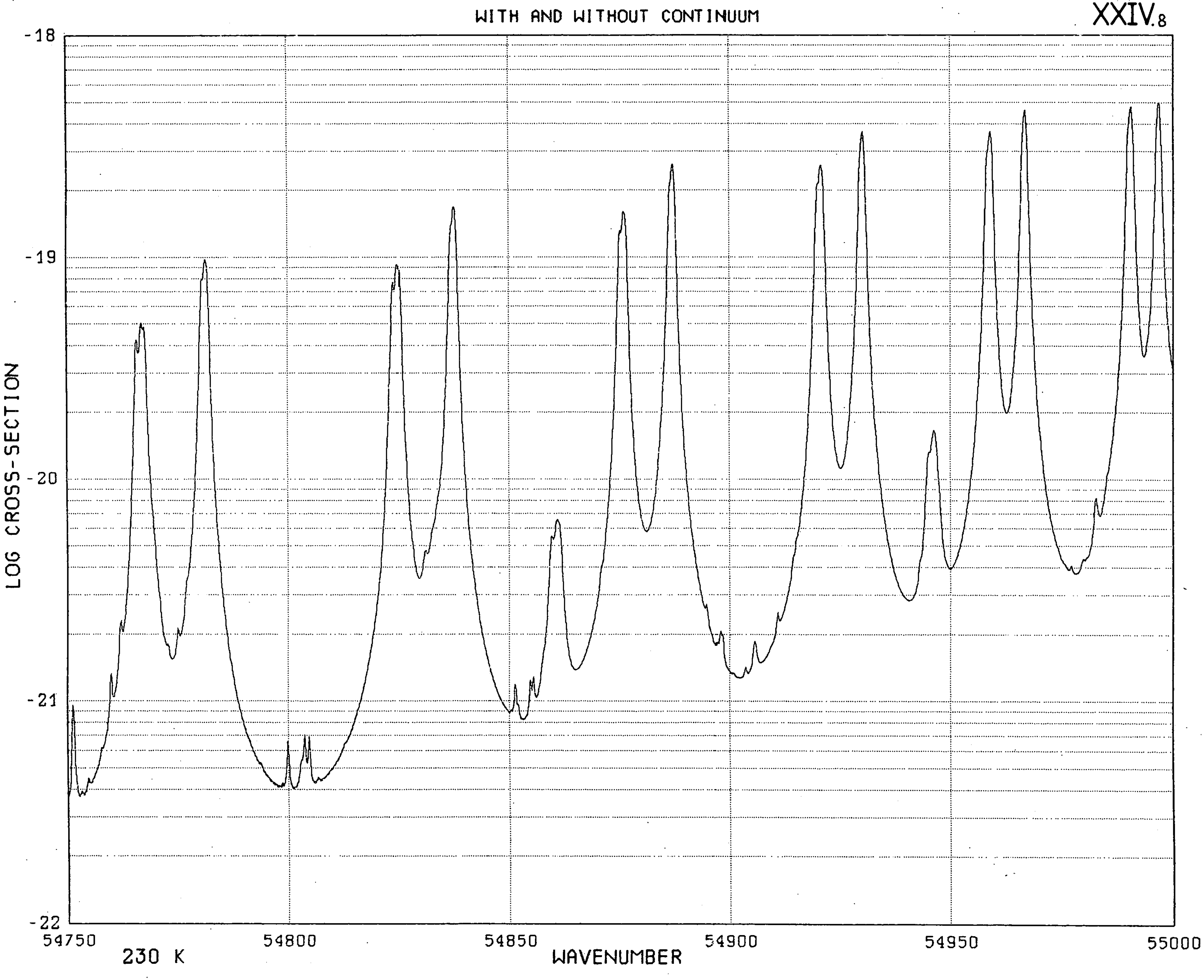

CONTINUUM-VARIATION 10% AND 20%
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54750
54800
54850
54900
54950
55000
300 K
WAVENUMBER

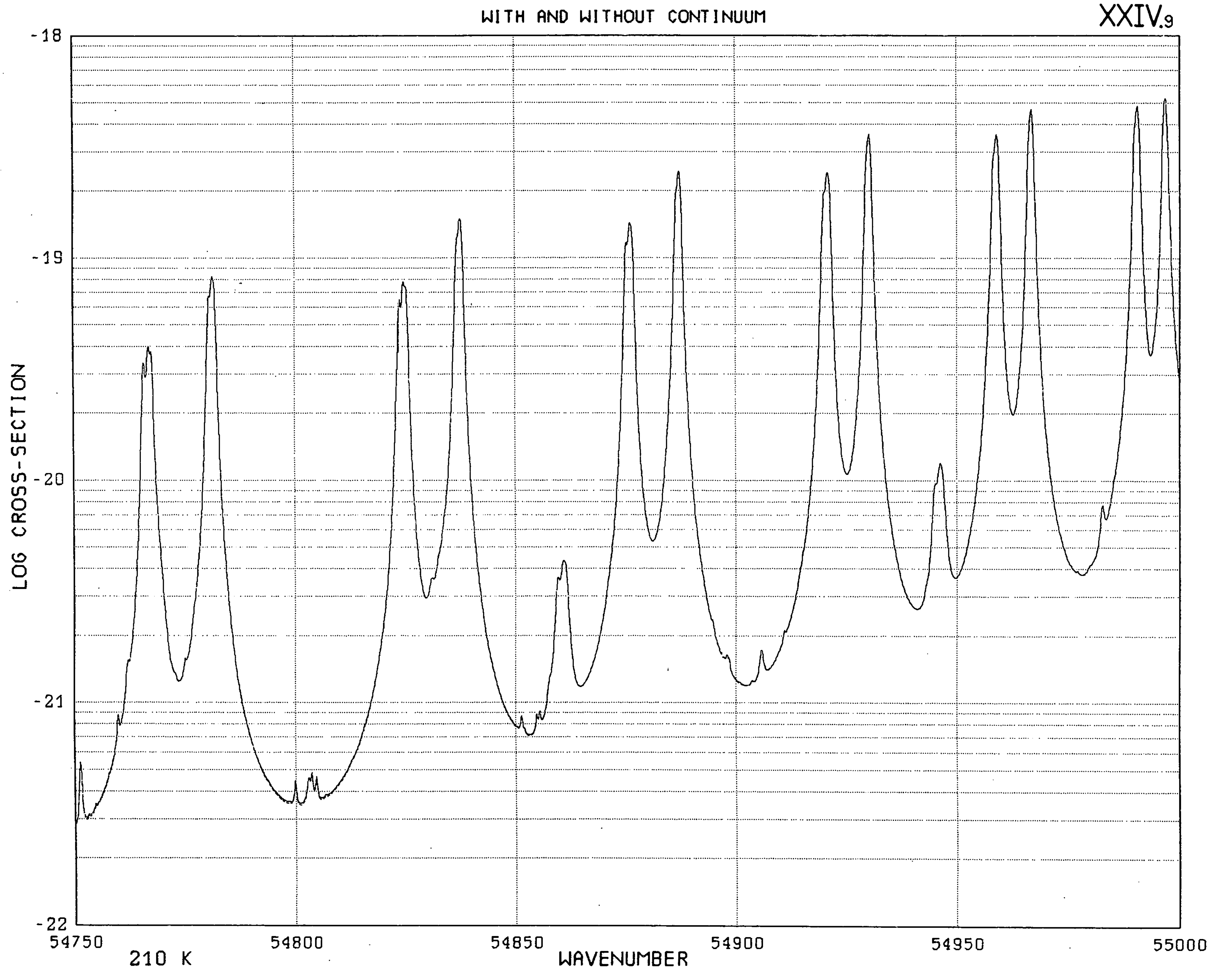

300 K - TEMPERATURE - 190 K
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54750
54800
54850
54900
54950
55000
WAVENUMBER
300-270-230-190 K

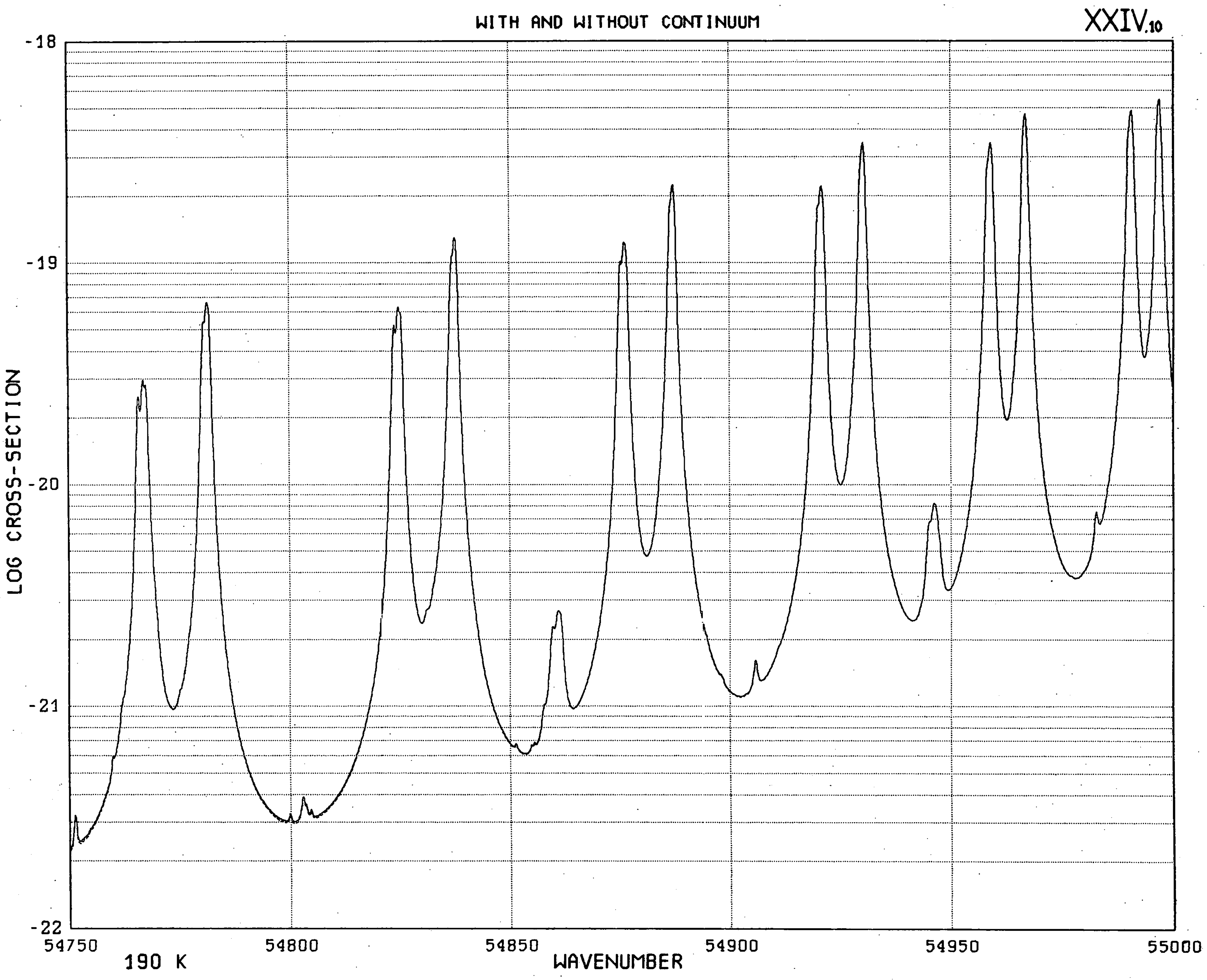

WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54750
54800
54850
54900
54950
55000
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54750
54800
54850
54900
54950
55000
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54750
54800
54850
54900
54950
55000
WAVENUMBER
250 K


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54750
54800
54850
54900
54950
55000
230 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
54750
54800
54850
54900
54950
55000
210 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
XXIV.10
-18
-19
-20
-21
-22
LOG CROSS-SECTION
54750
54800
54850
54900
54950
55000
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
55000 - 55250 cm^{-1}

ν	λ	band	ν	λ	band	ν	λ	band	ν	λ	band
55000											
55001.1	1818.15	11-0 R23	55052.5	1816.45	18-1 R17	55138.3	1813.62	17-1 P11	55202.4	1811.52	11-0 R17
55002.0	1818.12	11-0 R23	55058.7	1816.24	16-1 P 9	55141.1	1813.53	11-0 R19	55202.4	1811.52	19-1 R15
55009.4	1817.87	19-1 R19	55058.9	1816.24	18-1 R17	55142.1	1813.50	11-0 R19	55202.9	1811.50	11-0 R17
55013.3	1817.74	16-1 P11	55063.6	1816.08	16-1 P 9	55142.8	1813.48	11-0 R19	55205.9	1811.40	17-1 R 9
55013.5	1817.74	19-1 P19	55064.2	1816.06	16-1 P 9	55144.4	1813.42	16-1 P 3	55207.3	1811.35	17-1 R 9
55015.2	1817.68	10-0 R 7	55073.0	1815.77	16-1 R 9	55145.6	1813.38	12-0 R27	55218.4	1810.99	11-0 P15
55015.7	1817.66	10-0 R 7	55075.0	1815.71	11-0 R21	55146.3	1813.36	17-1 P11	55219.1	1810.97	11-0 P15
55016.0	1817.65	10-0 R 7	55075.8	1815.68	11-0 R21	55147.6	1813.32	17-1 P11	55219.5	1810.96	11-0 P15
55017.0	1817.62	17-1 P15	55078.4	1815.60	16-1 R 9	55148.3	1813.29	12-0 R27	55224.2	1810.80	17-1 P 7
55018.7	1817.56	16-1 P11	55079.4	1815.56	16-1 R 9	55148.7	1813.28	16-1 P 3	55227.2	1810.70	18-1 P11
55019.6	1817.53	16-1 P11	55082.1	1815.47	17-1 P13	55149.5	1813.25	16-1 P 3	55231.1	1810.57	17-1 P 7
55020.1	1817.52	18-1 P17	55084.5	1815.39	19-1 P17	55149.8	1813.24	16-1 R 3	55231.6	1810.56	17-1 P 7
55020.6	1817.50	10-0 P 5	55086.4	1815.33	12-0 P27	55150			55233.9	1810.48	17-1 R 7
55020.8	1817.49	10-0 P 5	55088.7	1815.25	12-0 P27	55150.1	1813.23	12-0 R27	55235.4	1810.43	19-1 P13
55023.6	1817.40	11-0 P21	55090.1	1815.21	12-0 P27	55153.1	1813.13	17-1 R11	55238.0	1810.35	12-0 R25
55024.6	1817.37	11-0 P21	55090.7	1815.19	17-1 P13	55154.2	1813.10	16-1 R 3	55238.7	1810.32	18-1 P11
55025.1	1817.35	11-0 P21	55092.7	1815.12	17-1 P13	55154.6	1813.09	16-1 R 3	55238.7	1810.32	18-1 R11
55026.4	1817.31	17-1 P15	55095.3	1815.04	11-0 P19	55155.8	1813.05	16-1 P 1	55240.4	1810.27	12-0 R25
55029.0	1817.22	17-1 P15	55095.7	1815.02	16-1 P 7	55158.5	1812.96	16-1 R 1	55240.9	1810.25	18-1 P11
55030.5	1817.17	16-1 R11	55096.2	1815.01	11-0 P19	55160.3	1812.90	11-0 P17	55241.3	1810.24	17-1 R 7
55030.6	1817.17	19-1 R19	55096.7	1814.99	11-0 P19	55161.1	1812.87	11-0 P17	55241.9	1810.22	12-0 R25
55033.8	1817.06	10-0 R 5	55098.8	1814.92	18-1 P15	55161.5	1812.86	11-0 P17	55247.2	1810.05	19-1 R13
55034.3	1817.05	10-0 R 5	55098.9	1814.92	19-1 R17	55161.6	1812.85	16-1 Q 1	55249.5	1809.97	13-0 P29
55034.6	1817.04	10-0 R 5	55100			55161.7	1812.85	17-1 R11			
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55036.4	1816.98	16-1 R11	55100.6	1814.86	16-1 P 7	55163.7	1812.79	17-1 R11			
55036.5	1816.98	18-1 R17	55102.5	1814.80	19-1 P17	55164.9	1812.75	19-1 P15			
55036.6	1816.97	17-1 R15	55107.0	1814.65	16-1 R 7	55167.8	1812.65	18-1 P13			
55037.2	1816.95	10-0 P 3	55108.7	1814.60	19-1 P17	55178.1	1812.31	19-1 R15			
55037.7	1816.94	10-0 P 3	55108.7	1814.60	17-1 R13	55180.2	1812.24	18-1 P13			
55037.8	1816.93	16-1 R11	55111.4	1814.51	17-1 R13	55181.1	1812.22	18-1 R13			
55038.1	1816.92	10-0 P 3	55112.0	1814.49	16-1 R 7	55181.6	1812.20	19-1 P15			
55039.8	1816.87	19-1 R19	55112.3	1814.48	18-1 P15	55182.7	1812.16	12-0 P25			
55039.9	1816.87	18-1 P17	55112.6	1814.47	16-1 R 7	55183.2	1812.15	18-1 P13			
55045.9	1816.66	12-0 R29	55113.7	1814.43	18-1 R15	55184.8	1812.09	12-0 P25			
55046.4	1816.65	10-0 R 3	55116.3	1814.35	18-1 P15	55185.6	1812.07	17-1 P 9			
55046.8	1816.64	10-0 R 3	55118.5	1814.27	19-1 R17	55186.0	1812.05	12-0 P25			
55046.8	1816.64	17-1 R15	55124.3	1814.08	16-1 P 5	55186.4	1812.04	19-1 P15			
55047.6	1816.61	10-0 P 1	55126.1	1814.02	19-1 R17	55193.0	1811.82	17-1 P 9			
55048.9	1816.57	12-0 R29	55128.5	1813.95	18-1 R15	55193.9	1811.79	17-1 P 9			
55050			55128.6	1813.94	16-1 P 5	55194.6	1811.77	18-1 R13			
55050.2	1816.52	17-1 R15	55128.9	1813.93	16-1 P 5	55196.2	1811.72	19-1 R15			
55050.4	1816.52	10-0 Q 1	55132.6	1813.81	16-1 R 5	55197.9	1811.66	17-1 R 9			
55050.9	1816.50	12-0 R29	55133.6	1813.78	18-1 R15	55198.7	1811.64	18-1 R13			
55051.5	1816.48	10-0 R 1	55137.2	1813.66	16-1 R 5	55200					
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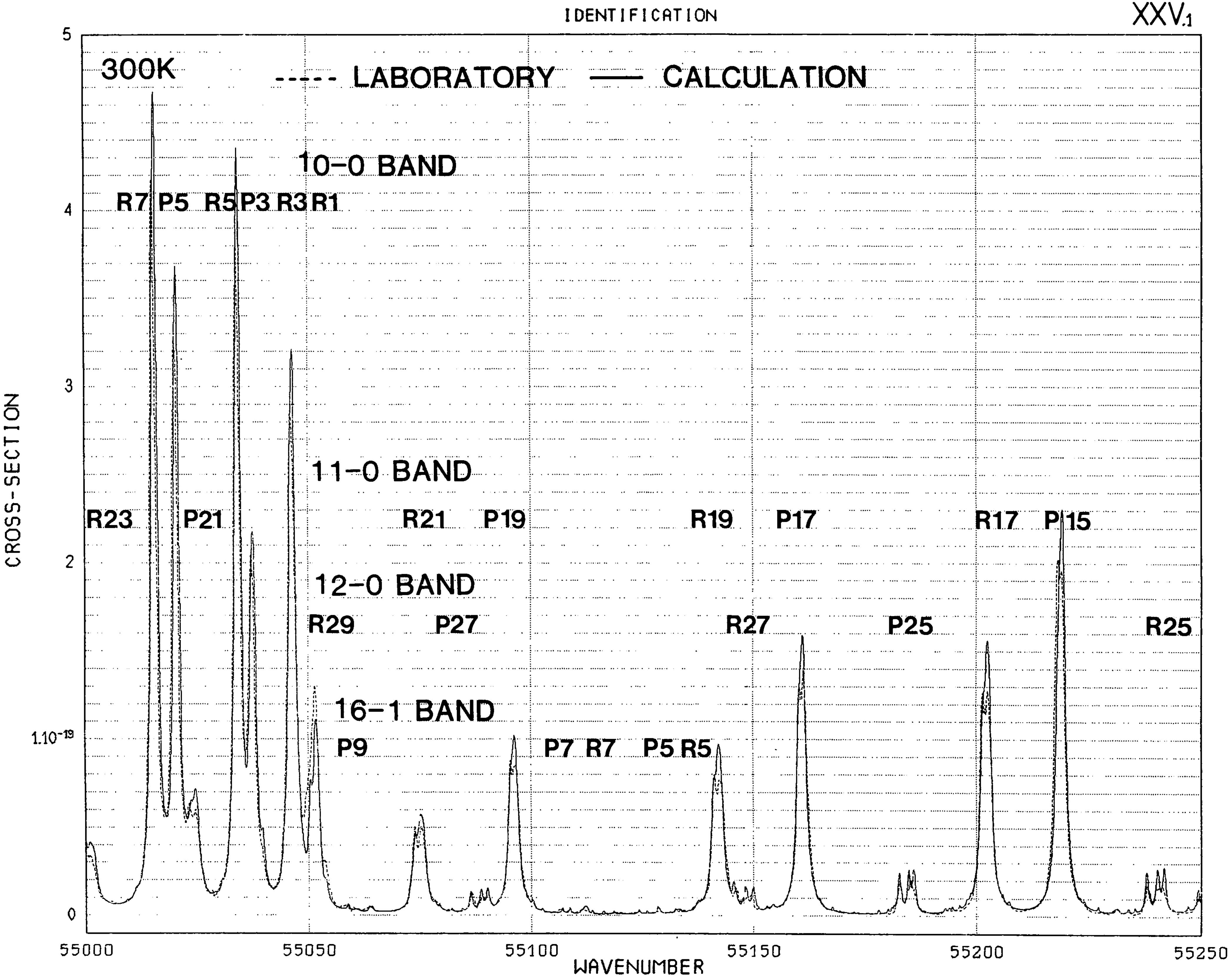
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300K
----- LABORATORY
CALCULATION
10-0 BAND
R7 P5 R5 P3 R3 R1
11-0 BAND
R23 P21 R21 P19 R19 P17 R17 P15
12-0 BAND
R29 P27 R27 P25 R25
16-1 BAND
P9 P7 R7 P5 R5
CROSS-SECTION
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4
3
2
1.10^-19
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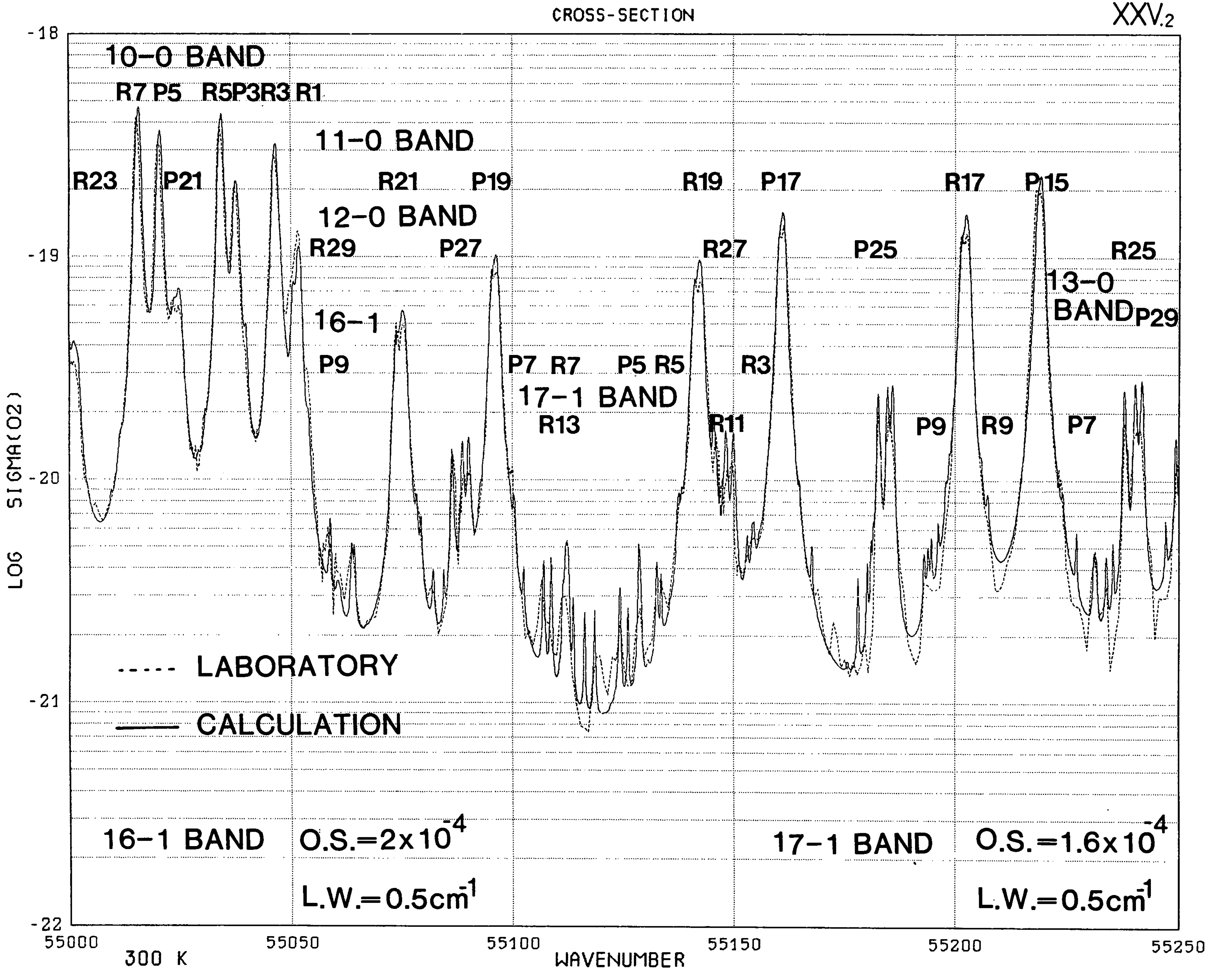
WAVENUMBER
55000
55050
55100
55150
55200
55250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LOG SIGMA(O2)
-18
-19
-20
-21
-22
55000
55050
55100
55150
55200
55250
WAVENUMBER
300 K
10-0 BAND
R7 P5 R5P3R3 R1
11-0 BAND
R23 P21 R21 P19 R19 P17 R17 P15
12-0 BAND
R29 P27 R27 P25 R25
13-0 BAND P29
16-1
P9 P7 R7 P5 R5 R3
17-1 BAND
R13 R11 P9 R9 P7
----- LABORATORY
—— CALCULATION
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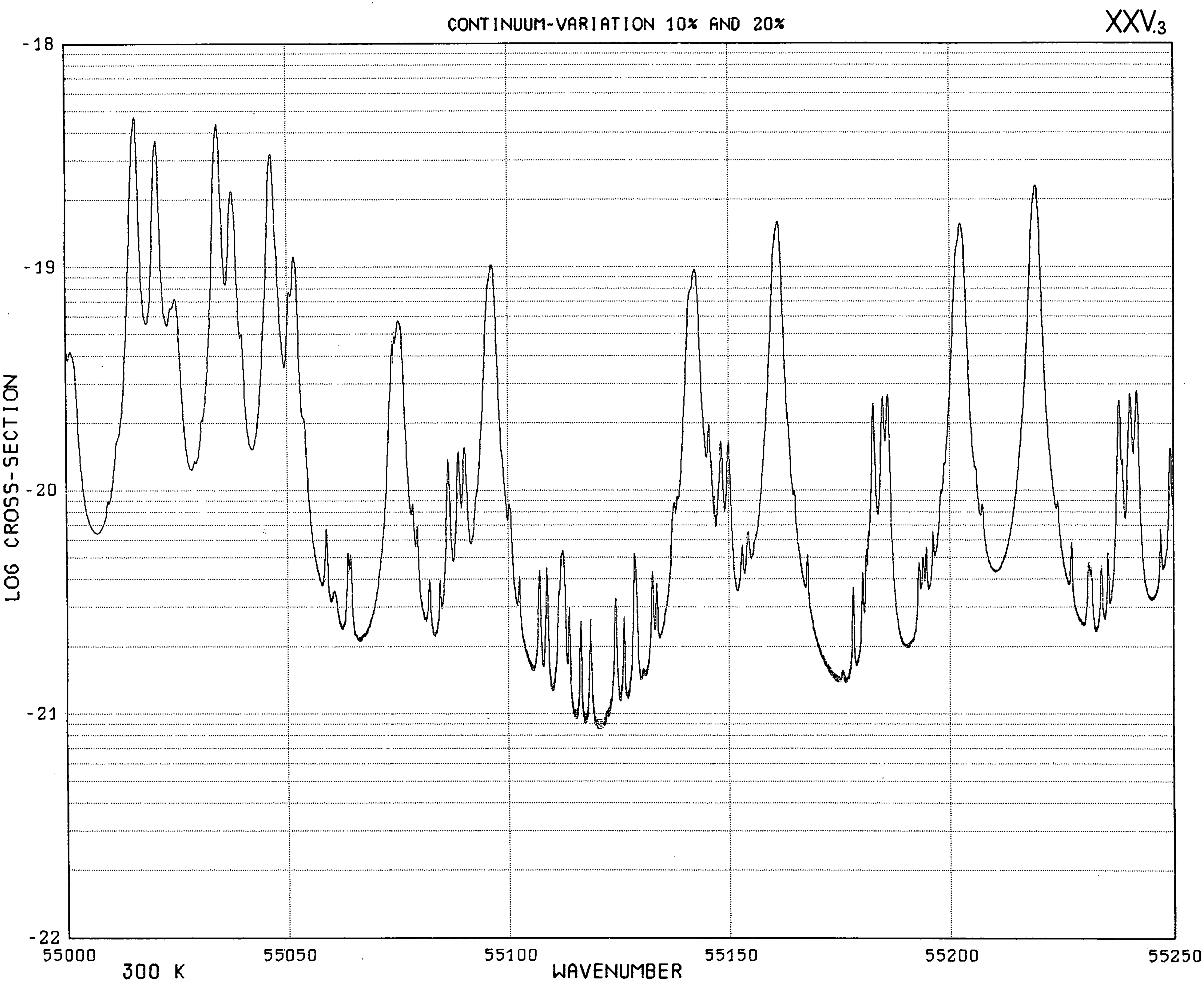
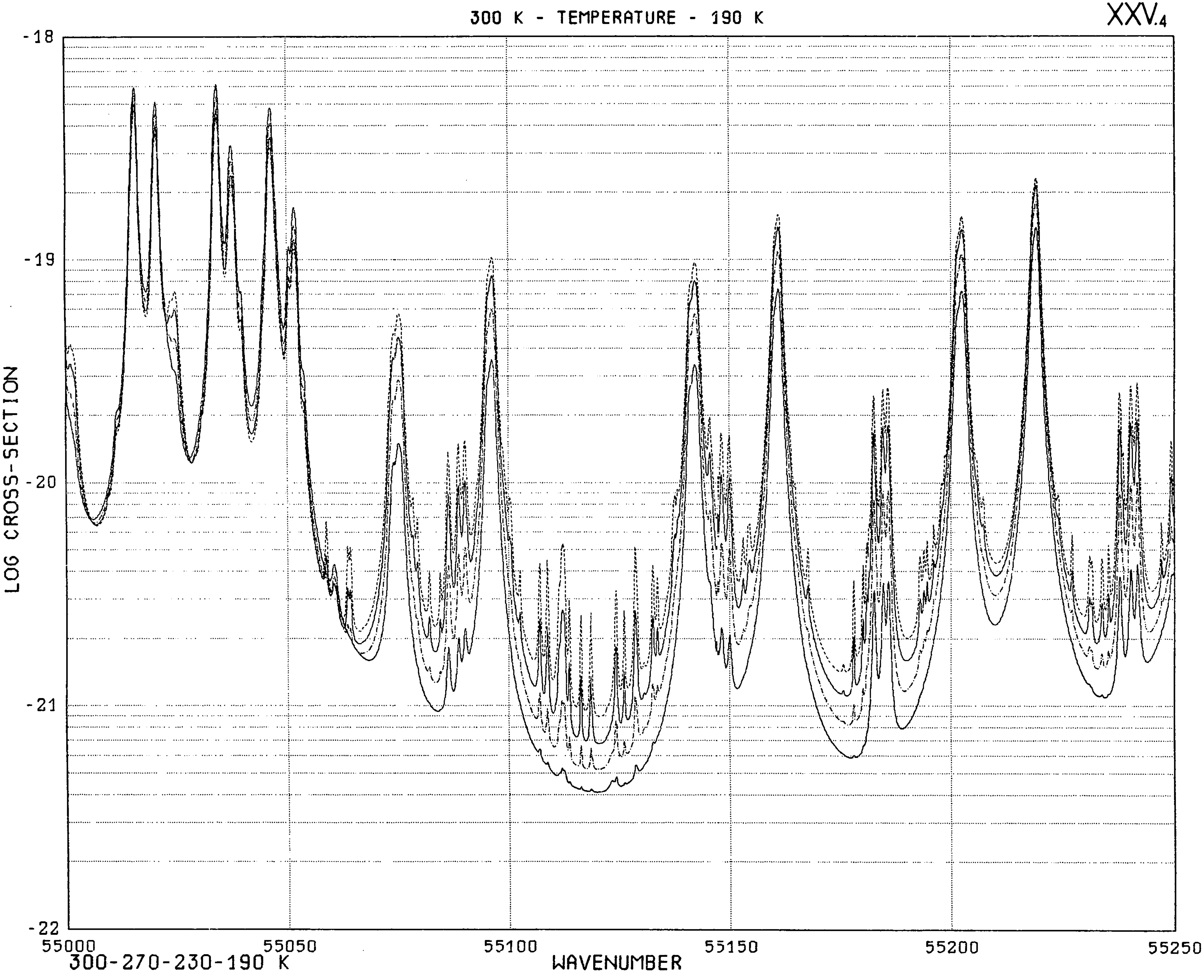
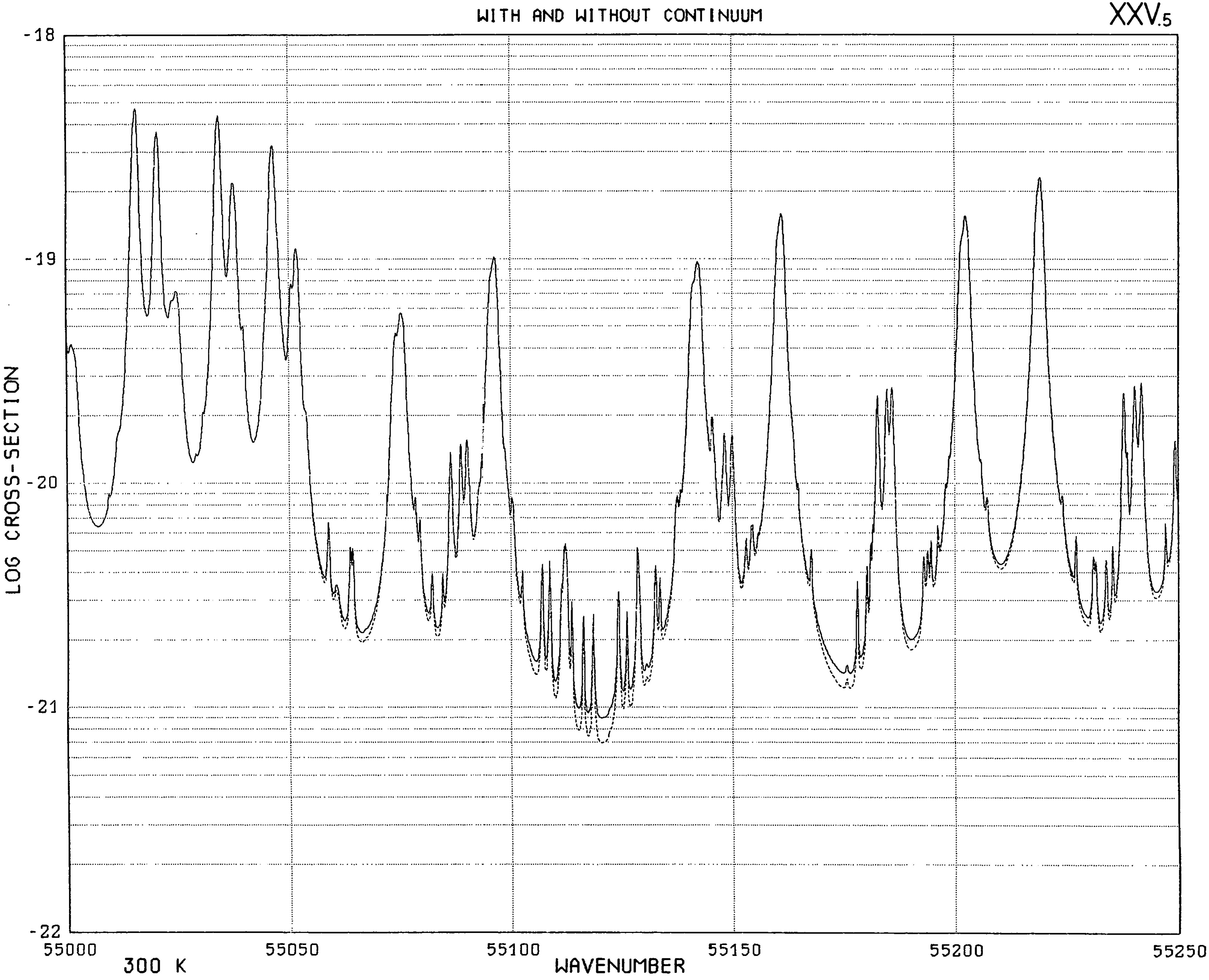
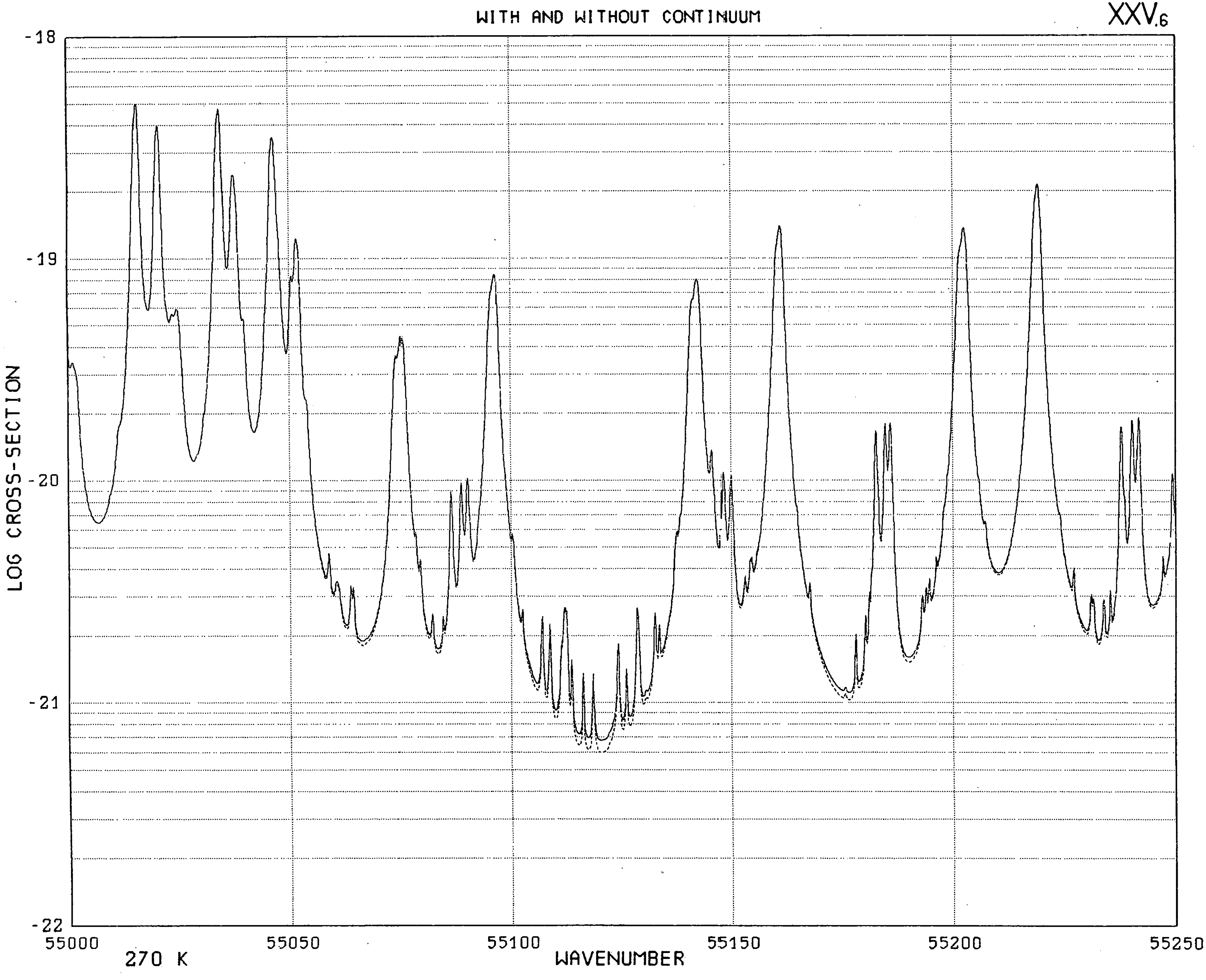
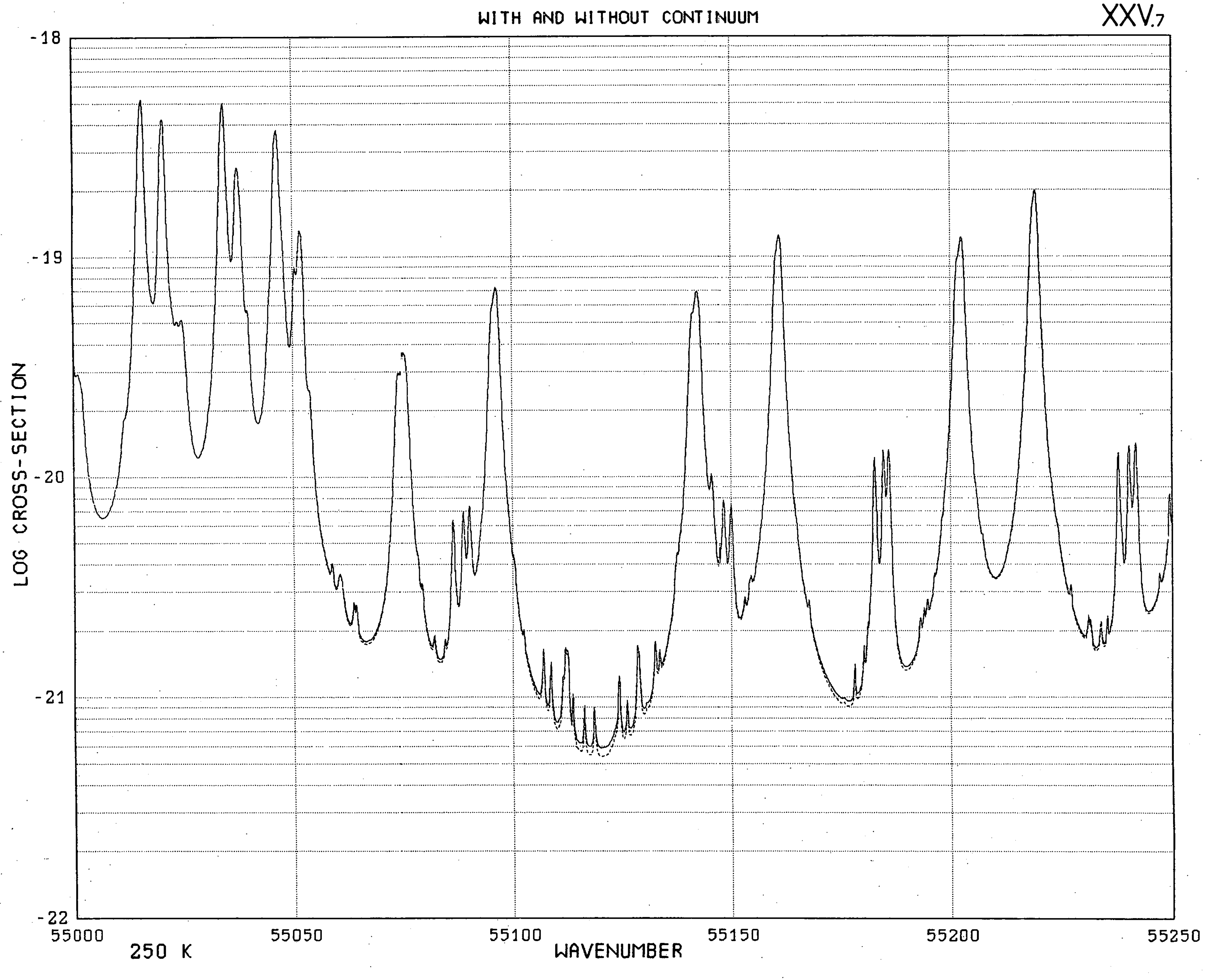
L.W.=0.5cm-1
17-1 BAND O.S.=1.6x10-4
L.W.=0.5cm-1

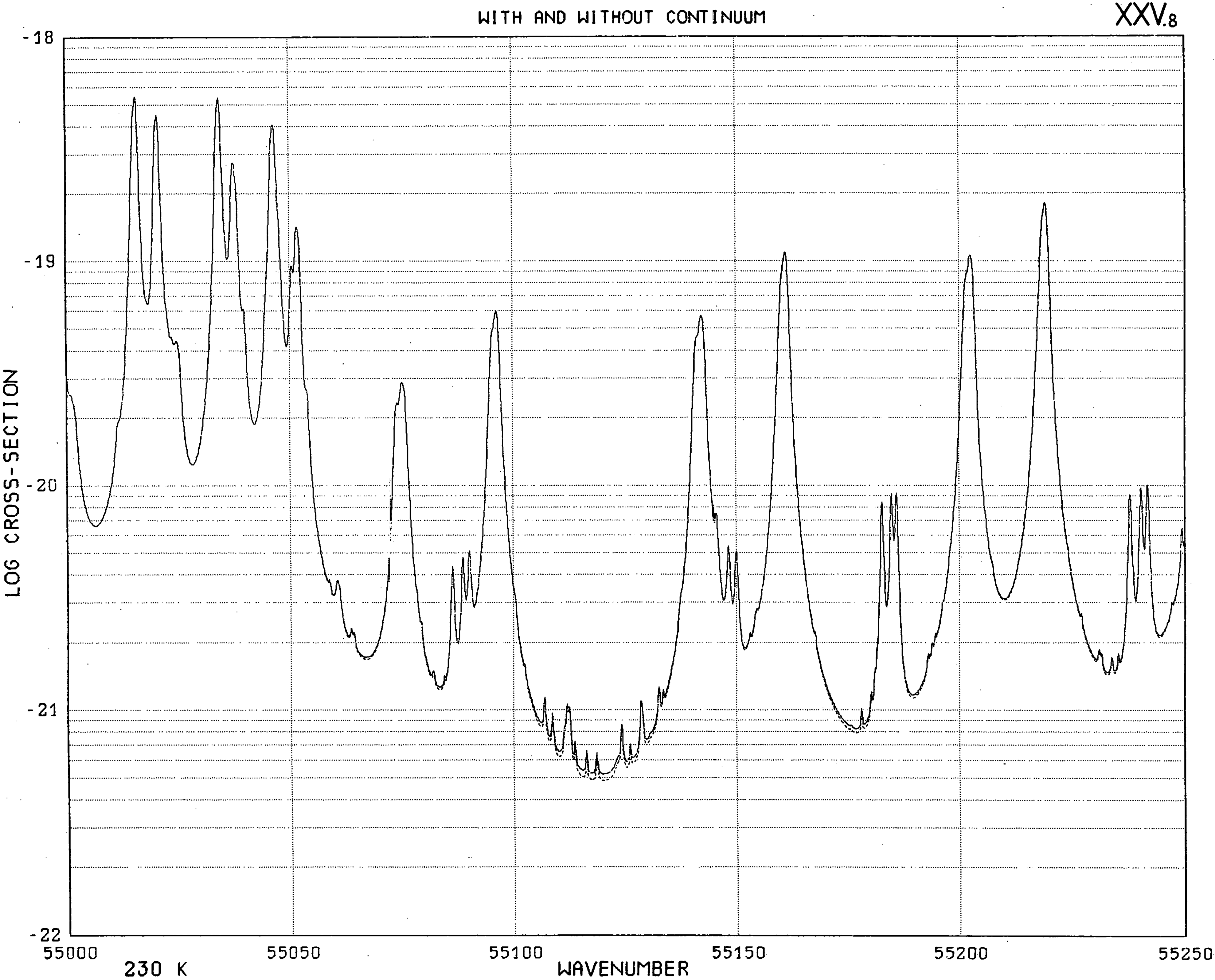

CONTINUUM-VARIATION 10% AND 20%
XXV.3
-18
-19
-20
-21
-22
LOG CROSS-SECTION
55000
55050
55100
55150
55200
55250
300 K
WAVENUMBER


300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-18
-19
-20
-21
-22
55000
55050
55100
55150
55200
55250
WAVENUMBER
300-270-230-190 K

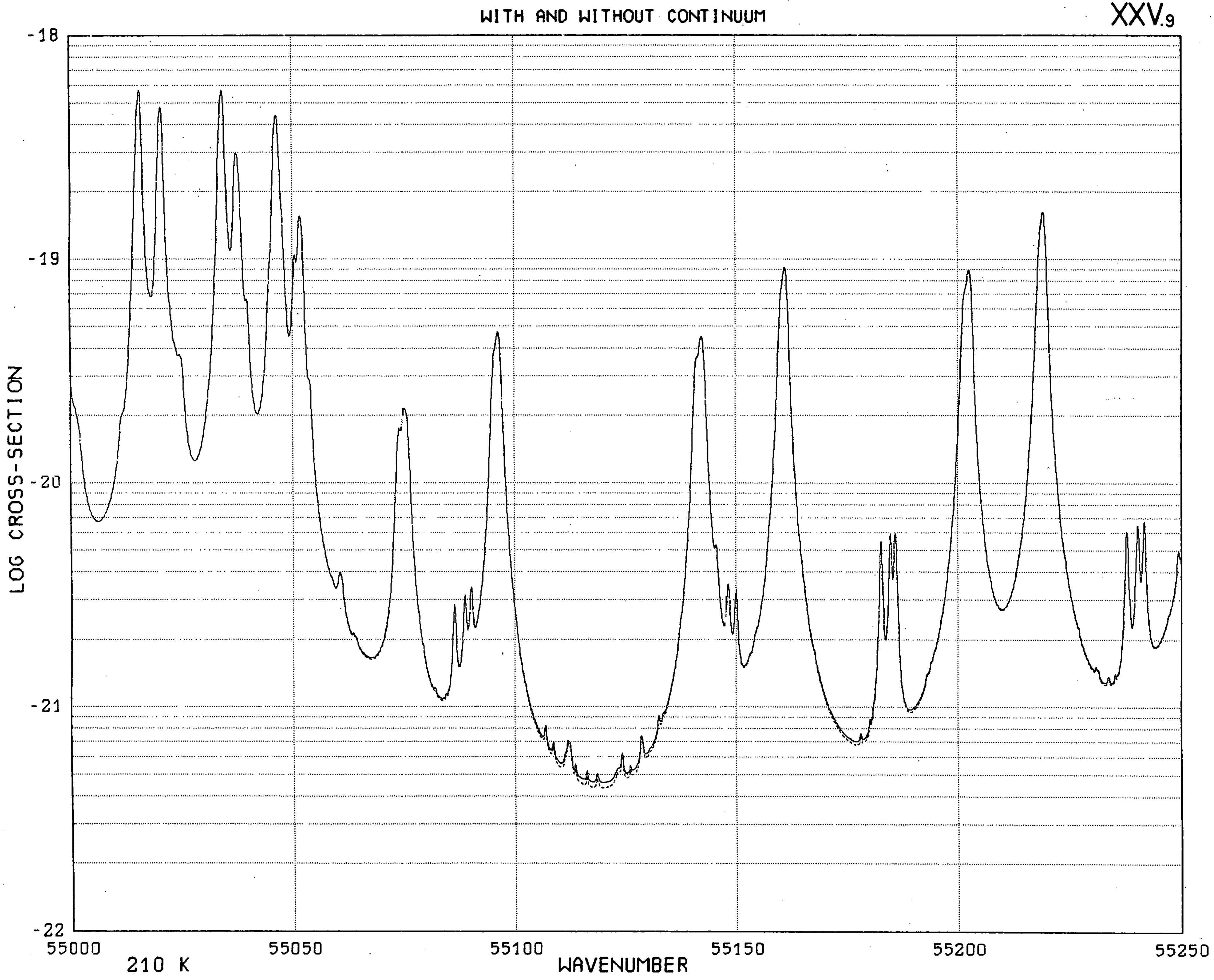

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
55000
55050
55100
55150
55200
55250
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
55000
55050
55100
55150
55200
55250
270 K
WAVENUMBER

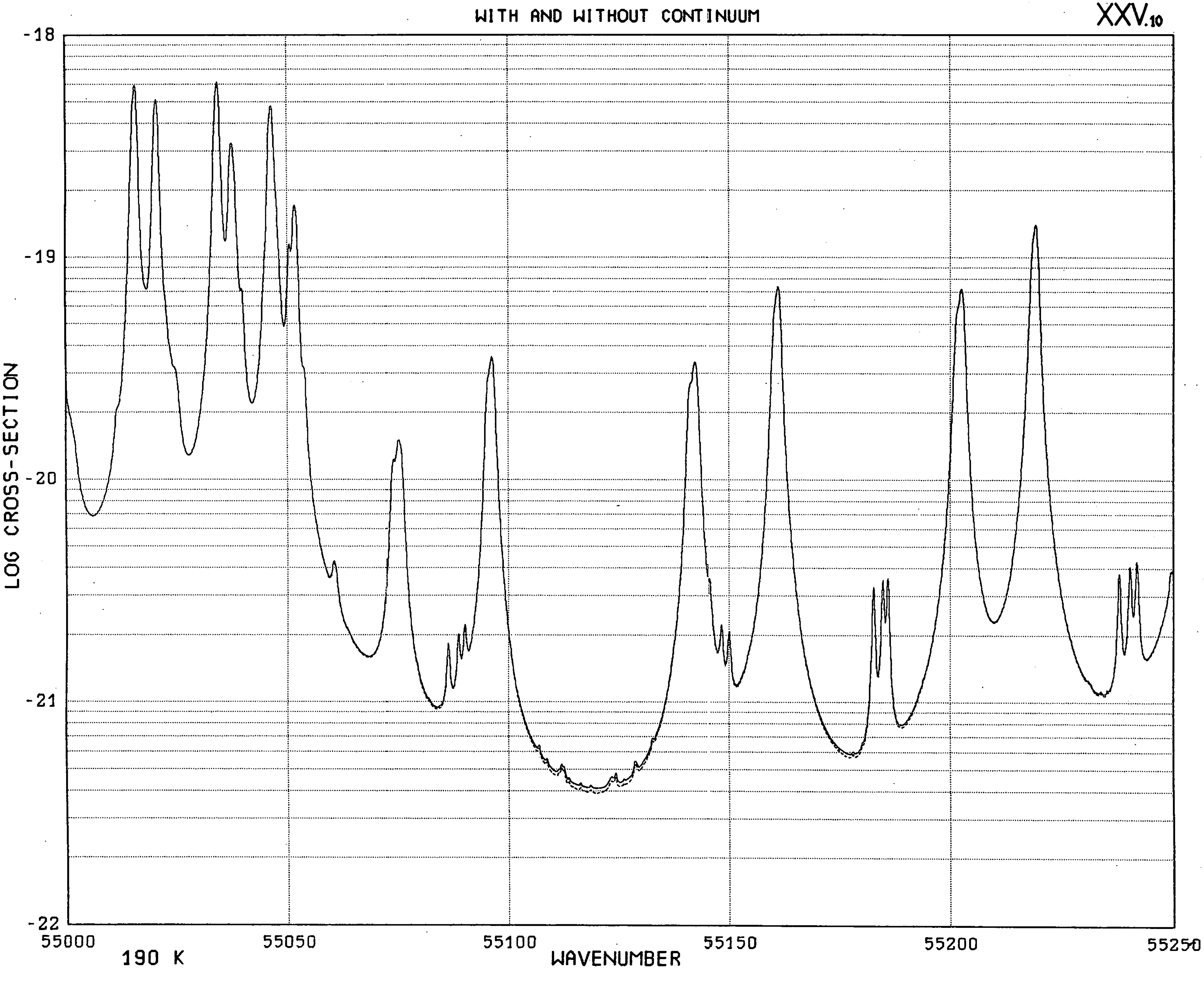

WITH AND WITHOUT CONTINUUM
XXV.7
-18
-19
-20
-21
-22
LOG CROSS-SECTION
55000
55050
55100
55150
55200
55250
250 K
WAVENUMBER



WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
-22
LOG CROSS-SECTION
55000
55050
55100
55150
55200
55250
230 K
WAVENUMBER



WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
55000
55050
55100
55150
55200
55250
210 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
55000
55050
55100
55150
55200
55250
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES

55250 - 55500 cm^{-1}

ν	λ	band	ν	λ	band	ν	λ	band	ν	λ	band
55250											
55250.8	1809.93	19-1 P13	55313.0	1807.89	19-1 P11	55382.9	1805.61	18-1 P 1	55439.2	1803.78	19-1 R 5
55251.2	1809.91	18-1 R11	55314.3	1807.85	11-0 P11	55383.2	1805.60	11-0 P 7	55439.3	1803.77	11-0 R 1
55253.3	1809.85	13-0 P29	55314.9	1807.83	13-0 R29	55383.7	1805.58	11-0 P 7	55439.9	1803.75	11-0 R 1
55253.9	1809.83	17-1 P 5	55314.9	1807.83	11-0 P11	55383.9	1805.58	11-0 P 7	55442.5	1803.67	19-1 P 3
55254.3	1809.81	18-1 R11	55315.2	1807.82	11-0 P11	55384.0	1805.57	18-1 R 3	55445.9	1803.56	19-1 R 3
55254.5	1809.81	19-1 P13	55317.8	1807.74	18-1 P 7	55384.9	1805.55	18-1 R 1	55450		
55254.9	1809.79	11-0 R15	55321.8	1807.60	19-1 R11	55384.9	1805.55	18-1 R 3	55454.1	1803.29	19-1 P 3
55255.8	1809.76	11-0 R15	55322.9	1807.57	12-0 R23	55388.5	1805.43	19-1 P 7	55454.9	1803.27	19-1 P 1
55255.9	1809.76	13-0 P29	55325.1	1807.50	12-0 R23	55393.3	1805.27	18-1 Q 1	55455.3	1803.25	19-1 P 3
55256.2	1809.75	11-0 R15	55325.5	1807.49	18-1 R 7	55394.3	1805.24	18-1 R 1	55456.6	1803.21	19-1 R 1
55260.5	1809.61	17-1 P 5	55325.5	1807.48	19-1 R11	55395.4	1805.20	19-1 R 7	55457.8	1803.17	19-1 R 3
55261.0	1809.60	17-1 P 5	55326.4	1807.46	12-0 R23	55400			55458.5	1803.15	13-0 P25
55261.1	1809.59	17-1 R 5	55327.7	1807.41	18-1 P 7	55400.6	1805.03	12-0 R21	55458.8	1803.14	19-1 R 3
55263.9	1809.50	19-1 R13	55328.7	1807.38	18-1 P 7	55401.0	1805.02	19-1 P 7	55461.7	1803.05	13-0 P25
55268.0	1809.36	17-1 R 5	55336.2	1807.14	18-1 R 7	55401.6	1805.00	11-0 R 7	55463.6	1802.98	13-0 P25
55268.6	1809.35	17-1 R 5	55337.7	1807.09	18-1 R 7	55401.8	1804.99	11-0 R 7	55466.4	1802.89	14-0 P29
55269.8	1809.31	11-0 P13	55341.5	1806.96	11-0 R11	55402.2	1804.98	19-1 P 7	55467.5	1802.86	19-1 Q 1
55270.4	1809.29	11-0 P13	55342.2	1806.94	11-0 R11	55402.6	1804.97	12-0 R21	55468.3	1802.83	19-1 R 1
55270.7	1809.28	11-0 P13	55342.5	1806.93	11-0 R11	55403.7	1804.93	12-0 R21	55471.1	1802.74	12-0 R19
55271.8	1809.24	12-0 P23	55347.1	1806.78	19-1 P 9	55407.5	1804.81	11-0 P 5	55471.9	1802.71	14-0 P29
55273.6	1809.18	12-0 P23	55350			55408.0	1804.79	11-0 P 5	55472.9	1802.68	12-0 R19
55274.7	1809.15	12-0 P23	55352.1	1806.62	11-0 P 9	55408.2	1804.79	11-0 P 5	55473.8	1802.65	12-0 R19
55274.7	1809.15	17-1 P 3	55352.7	1806.60	11-0 P 9	55408.7	1804.77	19-1 R 7	55475.6	1802.60	14-0 P29
55277.2	1809.07	18-1 P 9	55352.9	1806.59	11-0 P 9	55410.6	1804.71	19-1 R 7	55495.7	1801.94	12-0 P17
55279.5	1808.99	17-1 R 3	55353.6	1806.57	12-0 P21	55412.3	1804.65	13-0 R27	55497.1	1801.90	12-0 P17
55281.3	1808.93	17-1 P 3	55354.7	1806.53	18-1 R 5	55416.3	1804.52	13-0 R27	55497.7	1801.88	12-0 P17
55282.2	1808.90	17-1 P 3	55355.3	1806.51	12-0 P21	55419.0	1804.44	13-0 R27			
55286.1	1808.77	17-1 R 3	55355.8	1806.50	19-1 R 9	55420.4	1804.39	19-1 P 5			
55286.4	1808.76	17-1 P 1	55356.1	1806.48	12-0 P21	55420.5	1804.38	11-0 R 5			
55286.6	1808.76	17-1 R 3	55357.8	1806.43	13-0 P27	55421.1	1804.37	11-0 R 5			
55286.8	1808.75	18-1 R 9	55358.5	1806.41	18-1 P 5	55421.3	1804.36	11-0 R 5			
55287.9	1808.72	18-1 P 9	55359.2	1806.38	18-1 P 5	55425.0	1804.24	11-0 P 3			
55288.9	1808.68	17-1 R 1	55360.4	1806.35	19-1 P 9	55425.5	1804.23	19-1 R 5			
55289.3	1808.67	18-1 P 9	55361.3	1806.32	13-0 P27	55425.5	1804.22	11-0 P 3			
55294.3	1808.50	17-1 Q 1	55362.2	1806.29	19-1 P 9	55426.0	1804.21	11-0 P 3			
55295.5	1808.47	17-1 R 1	55363.6	1806.24	13-0 P27	55428.2	1804.13	12-0 P19			
55296.1	1808.45	19-1 P11	55364.7	1806.21	18-1 R 5	55429.8	1804.08	12-0 P19			
55298.4	1808.37	18-1 R 9	55365.7	1806.17	18-1 R 5	55430.5	1804.06	12-0 P19			
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55310.4	1807.98	19-1 P11	55380.0	1805.70	18-1 P 3	55438.0	1803.82	19-1 R 5			
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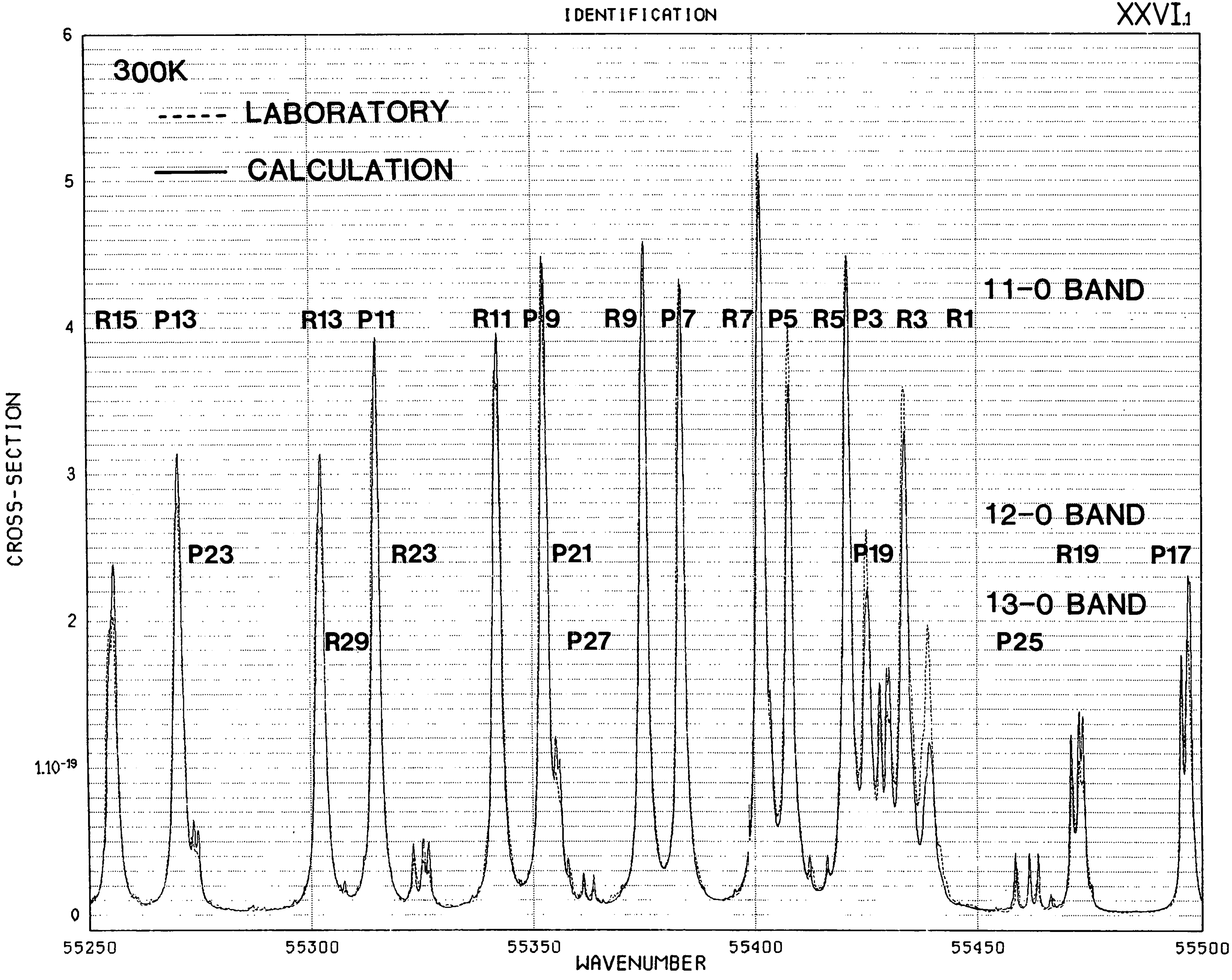
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LABORATORY
CALCULATION
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12-0 BAND
13-0 BAND
R15 P13 R13 P11 R11 P 9 R9 P 7 R7 P5 R5 P3 R3 R1
P23 R23 P21 P19 R19 P17
R29 P27 P25
CROSS-SECTION
WAVENUMBER
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4
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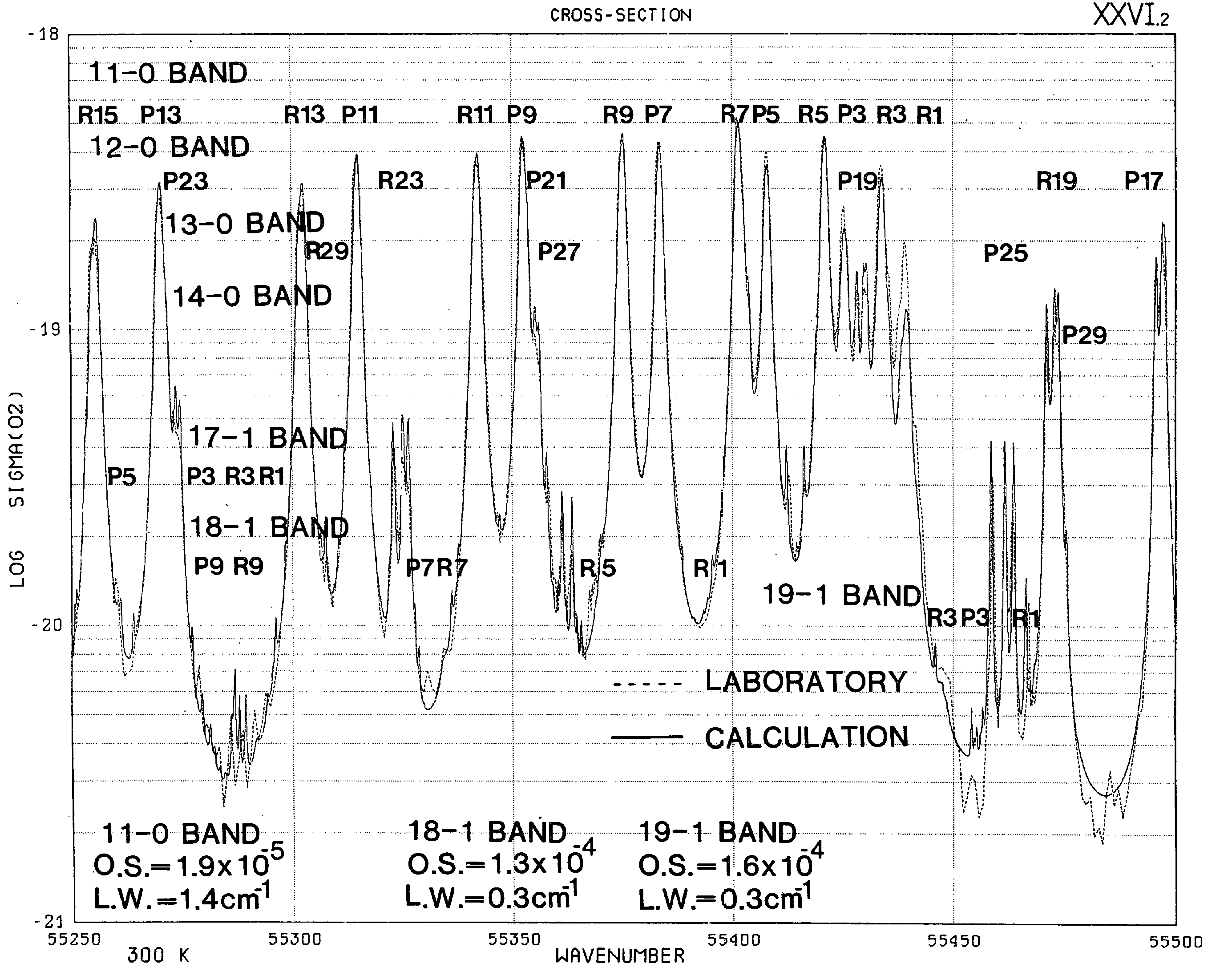
55350
55400
55450
55500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12-0 BAND
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R29 P27 P25
14-0 BAND
P29
17-1 BAND
P5 P3 R3 R1
18-1 BAND
P9 R9 P7 R7 R5 R1
19-1 BAND
R3 P3 R1
LABORATORY
CALCULATION
11-0 BAND
O.S.=1.9x10^{-5}
L.W.=1.4cm^{-1}
18-1 BAND
O.S.=1.3x10^{-4}
L.W.=0.3cm^{-1}
19-1 BAND
O.S.=1.6x10^{-4}
L.W.=0.3cm^{-1}
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55400
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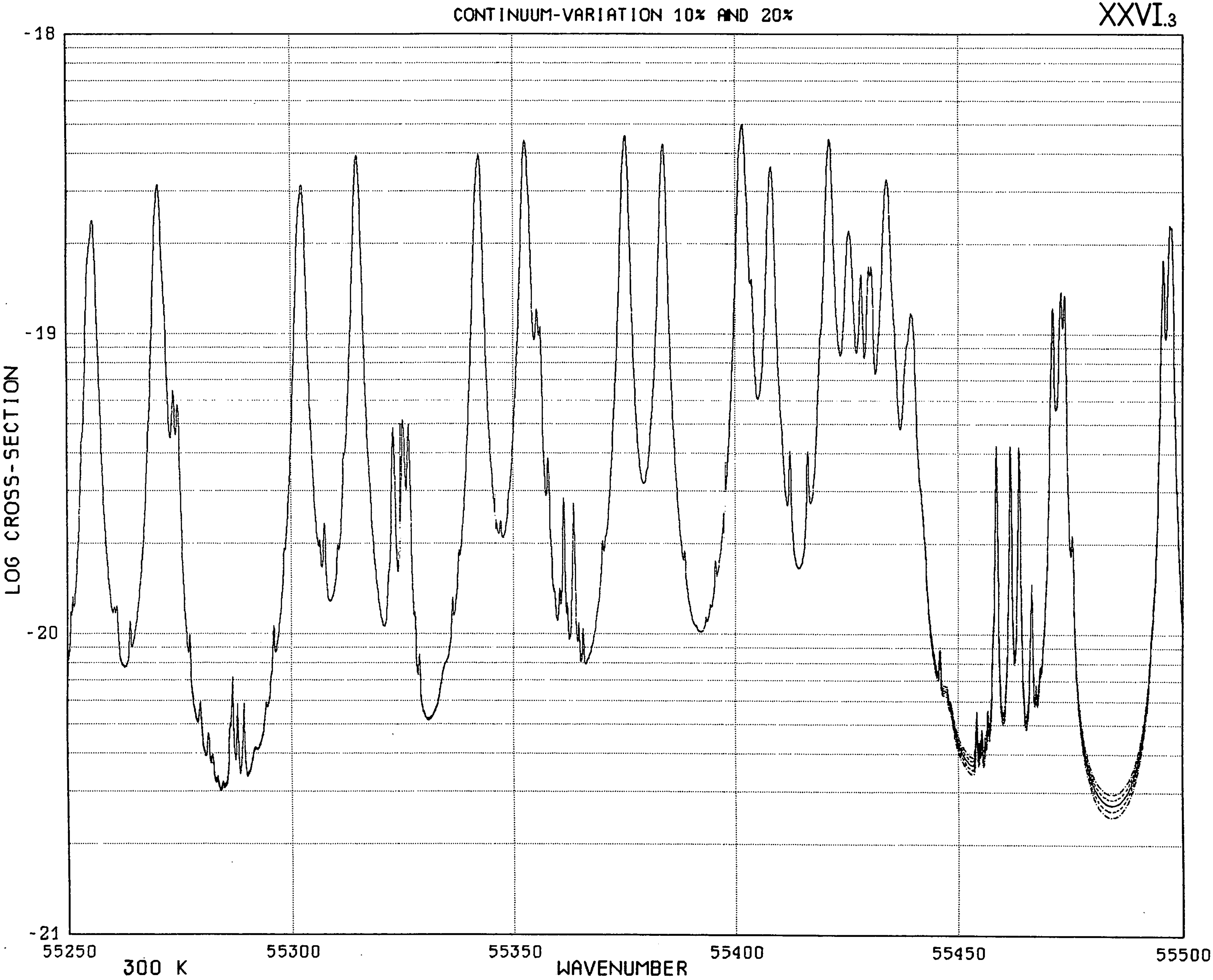
300 K
WAVENUMBER


CONTINUUM-VARIATION 10% AND 20%
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-19
-20
-21
LOG CROSS-SECTION
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55350
55400
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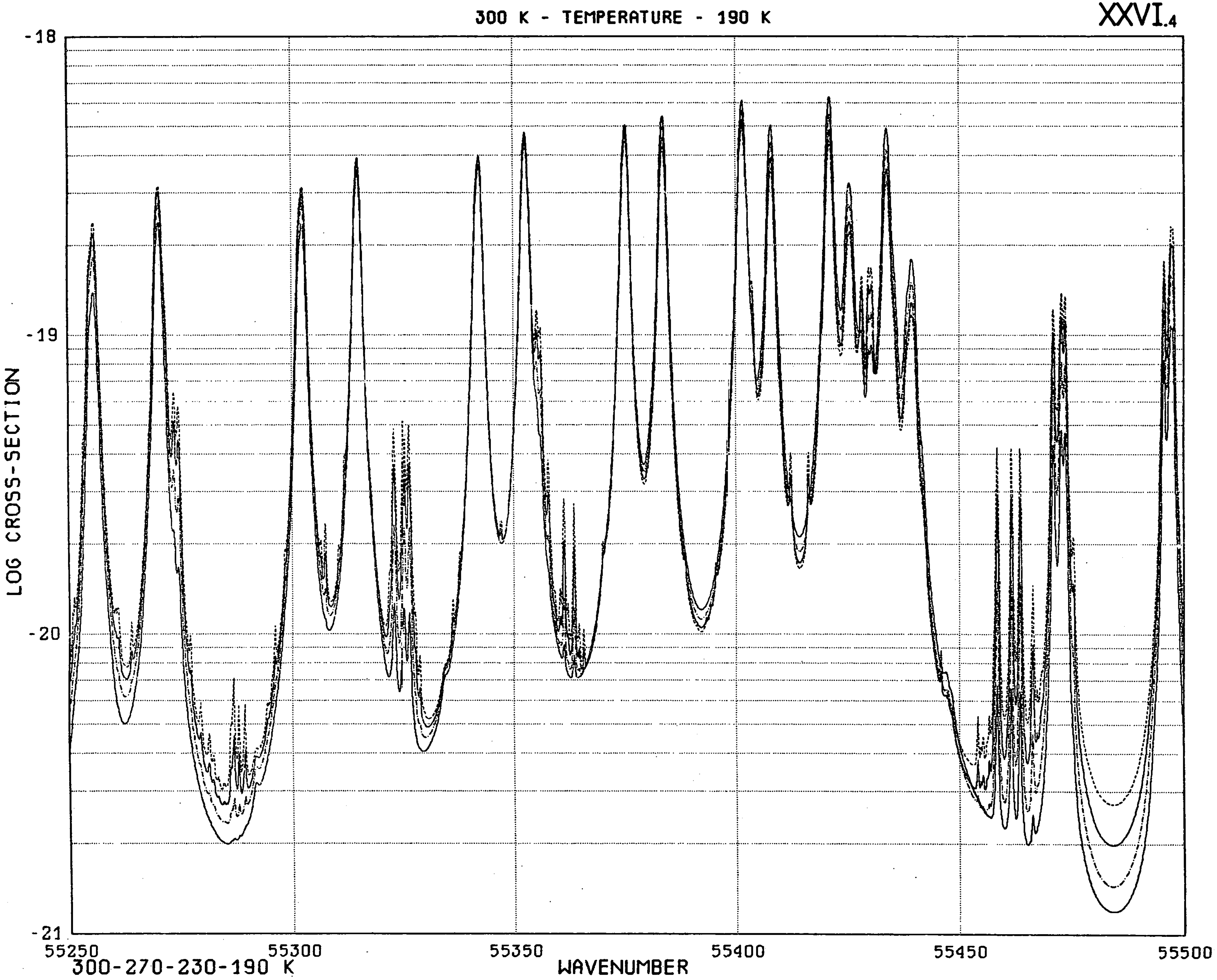
55500
300 K
WAVENUMBER


300 K - TEMPERATURE - 190 K
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-19
-20
-21
LOG CROSS-SECTION
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55300
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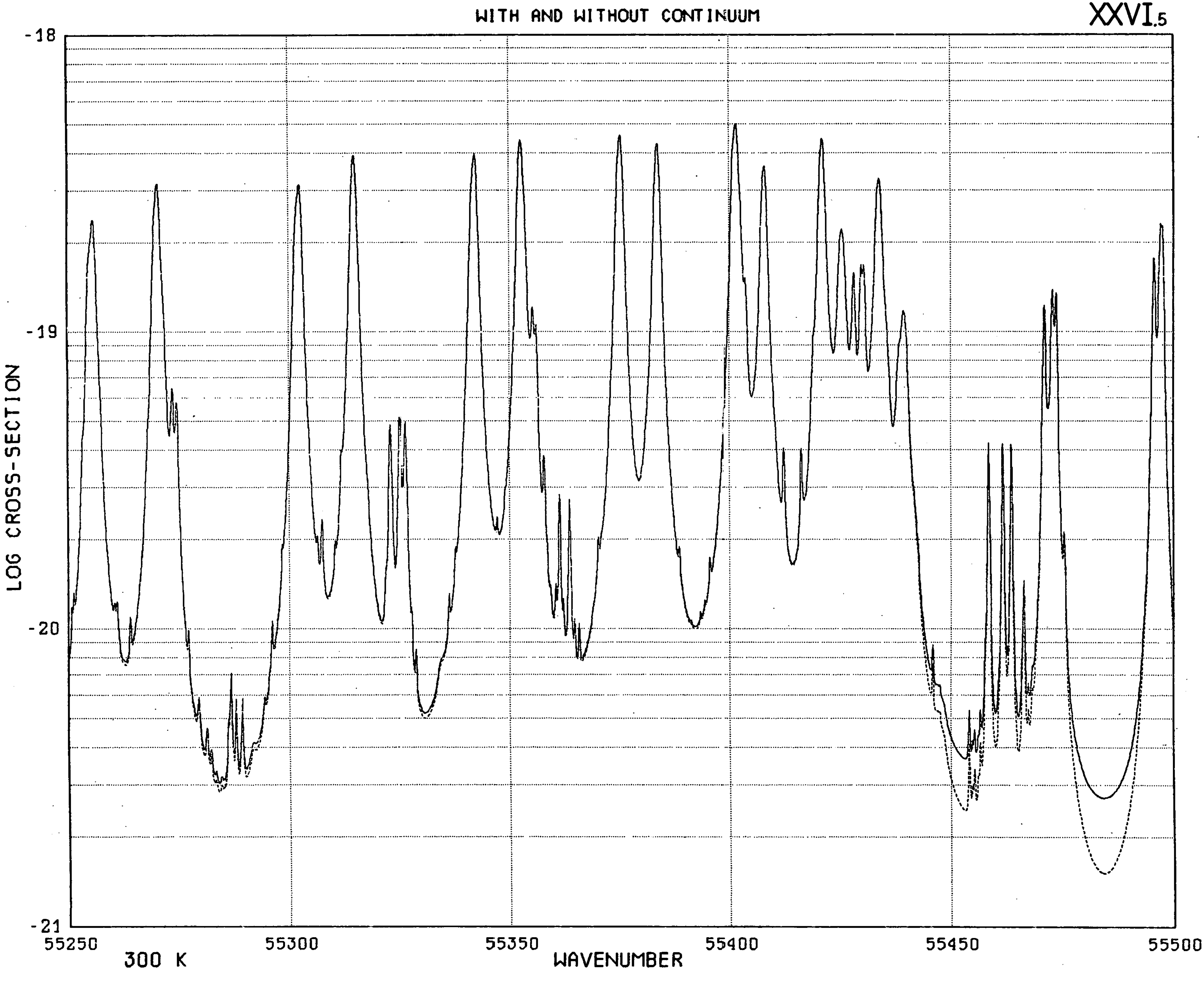
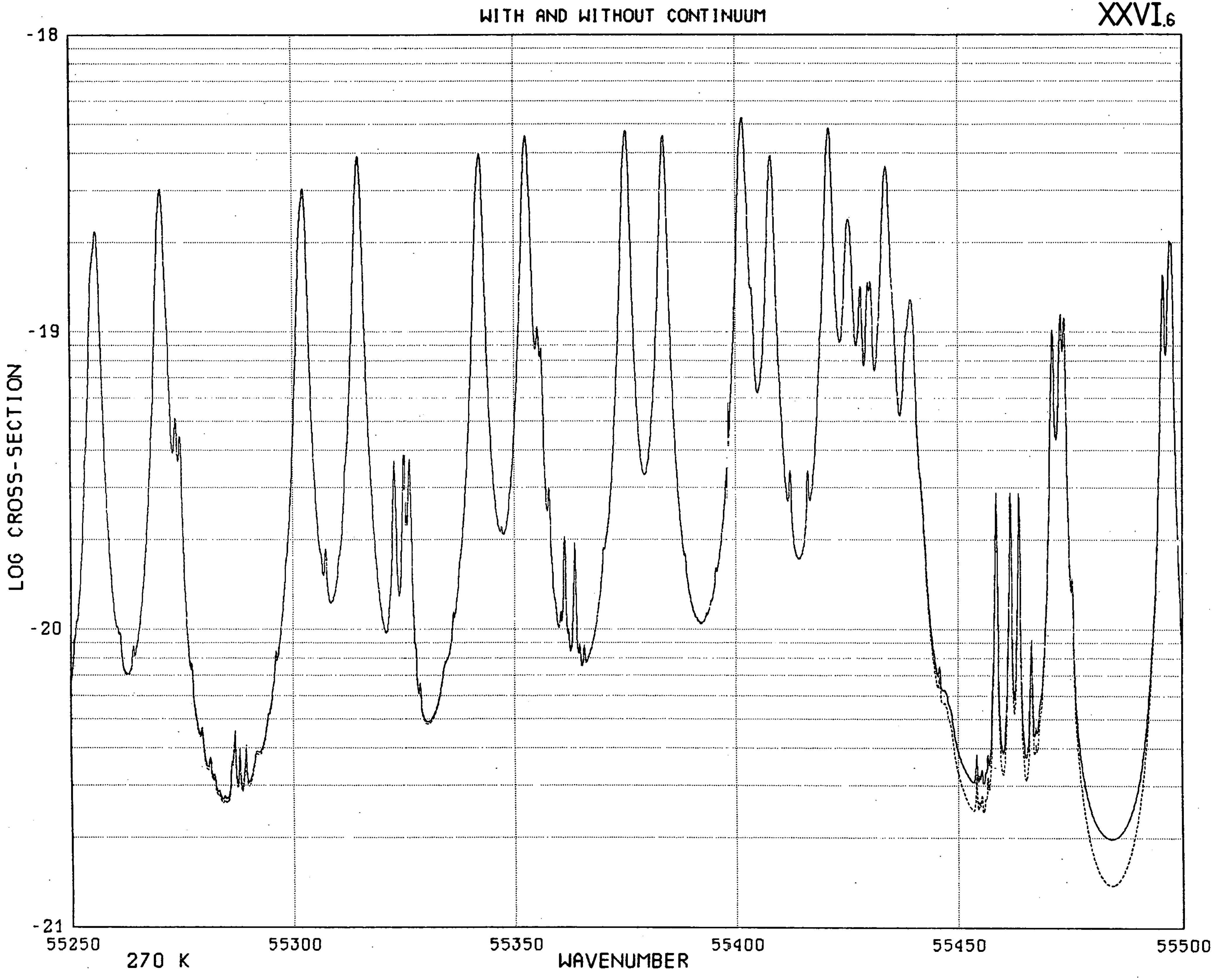
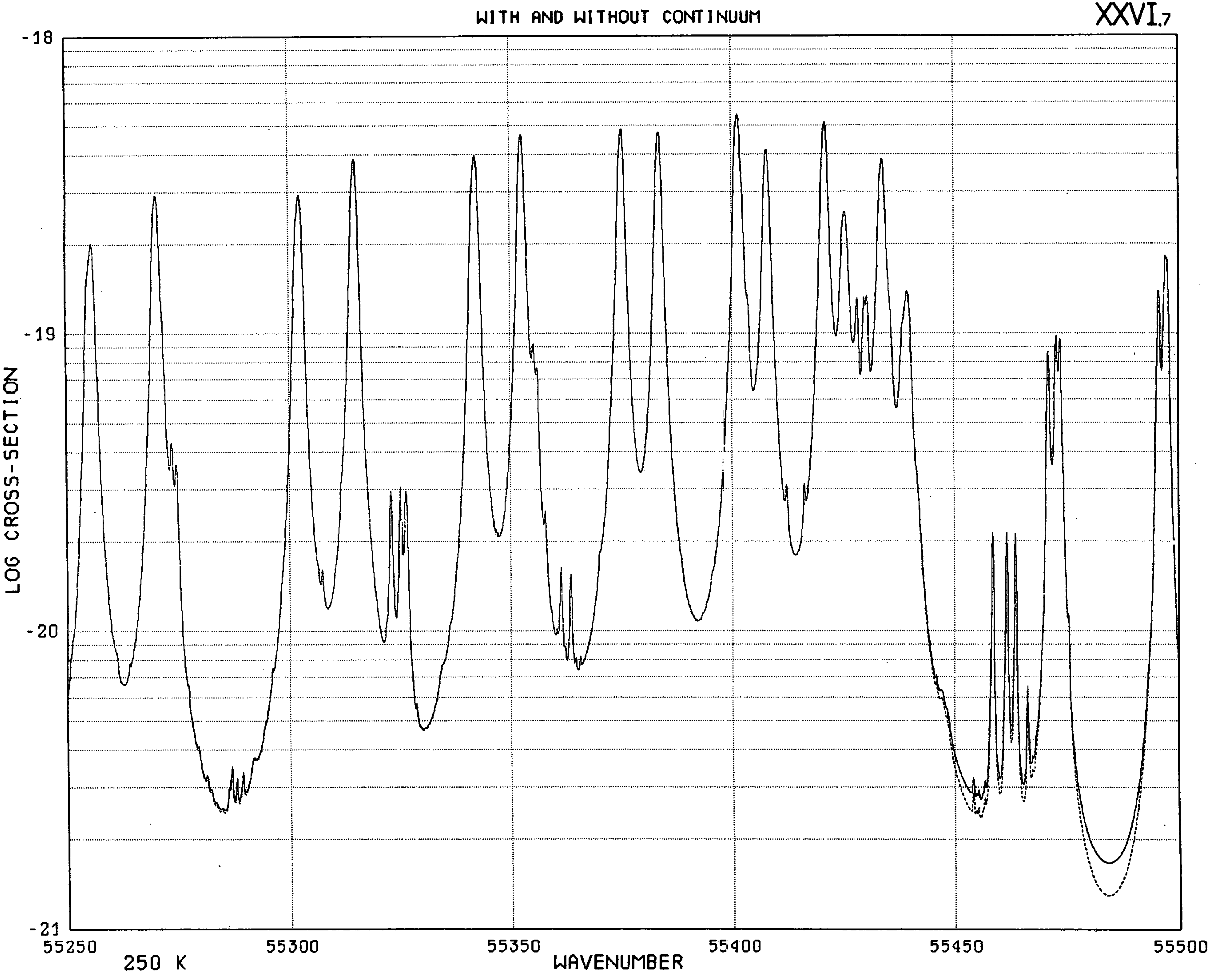
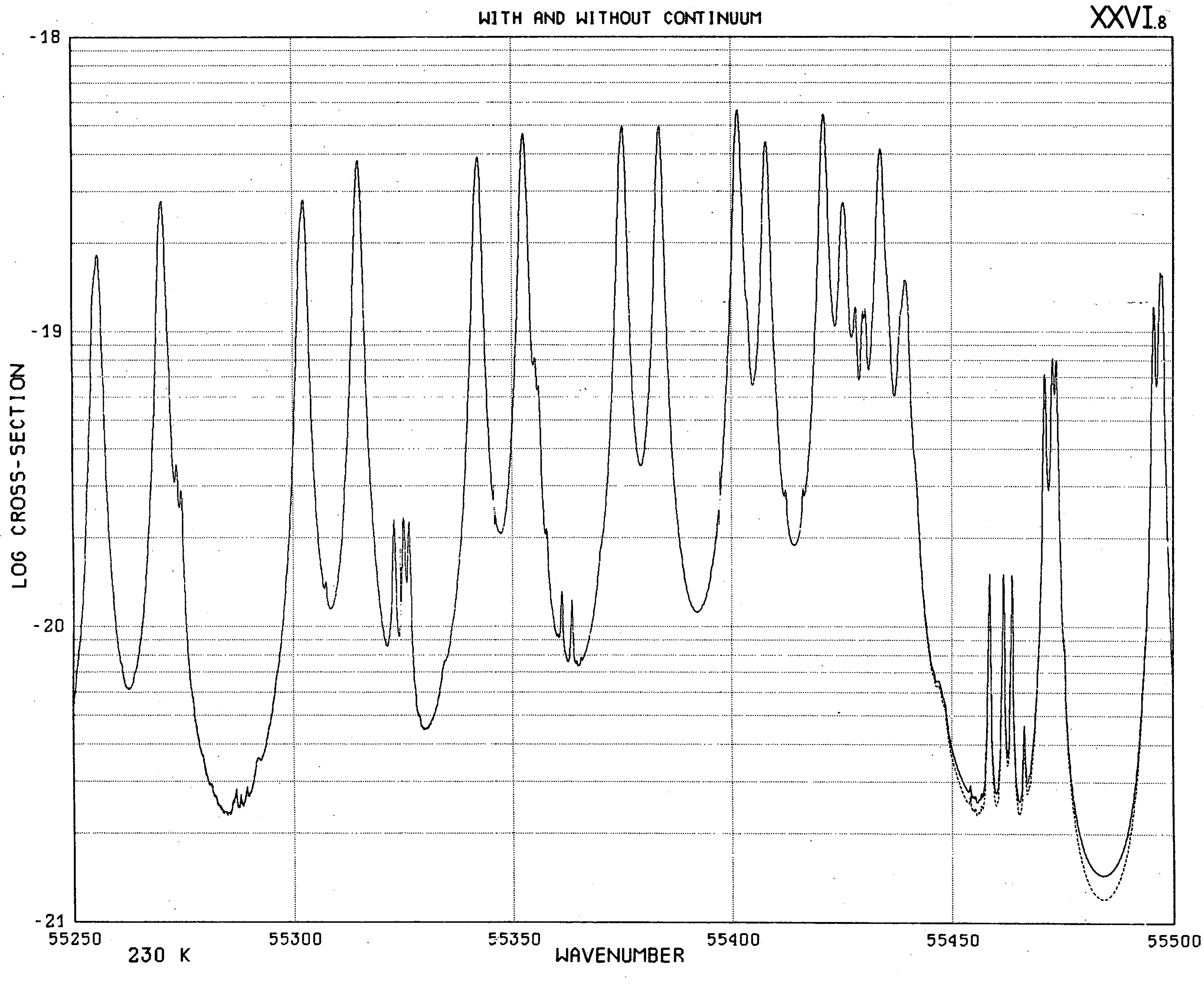
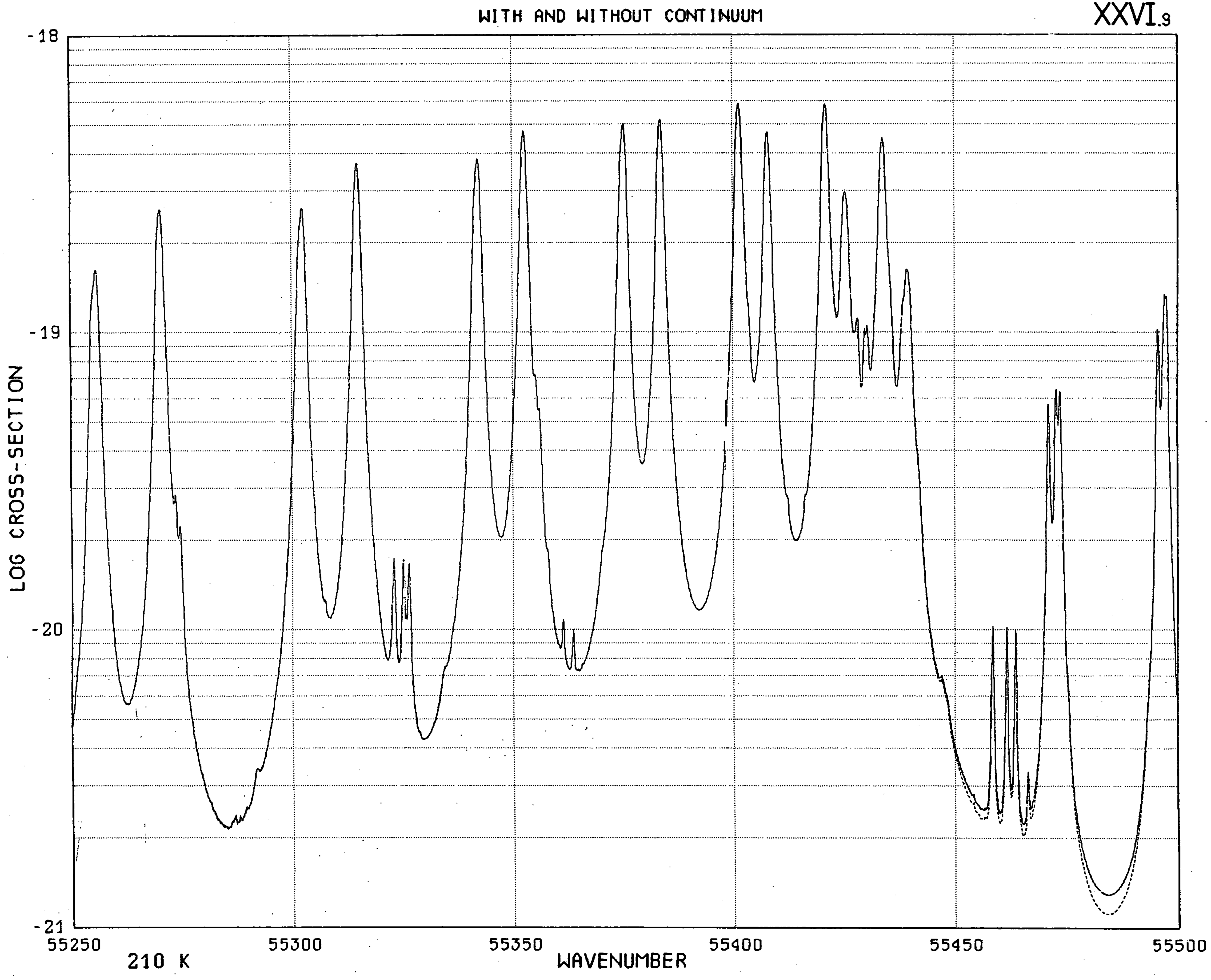
300-270-230-190 K
WAVENUMBER

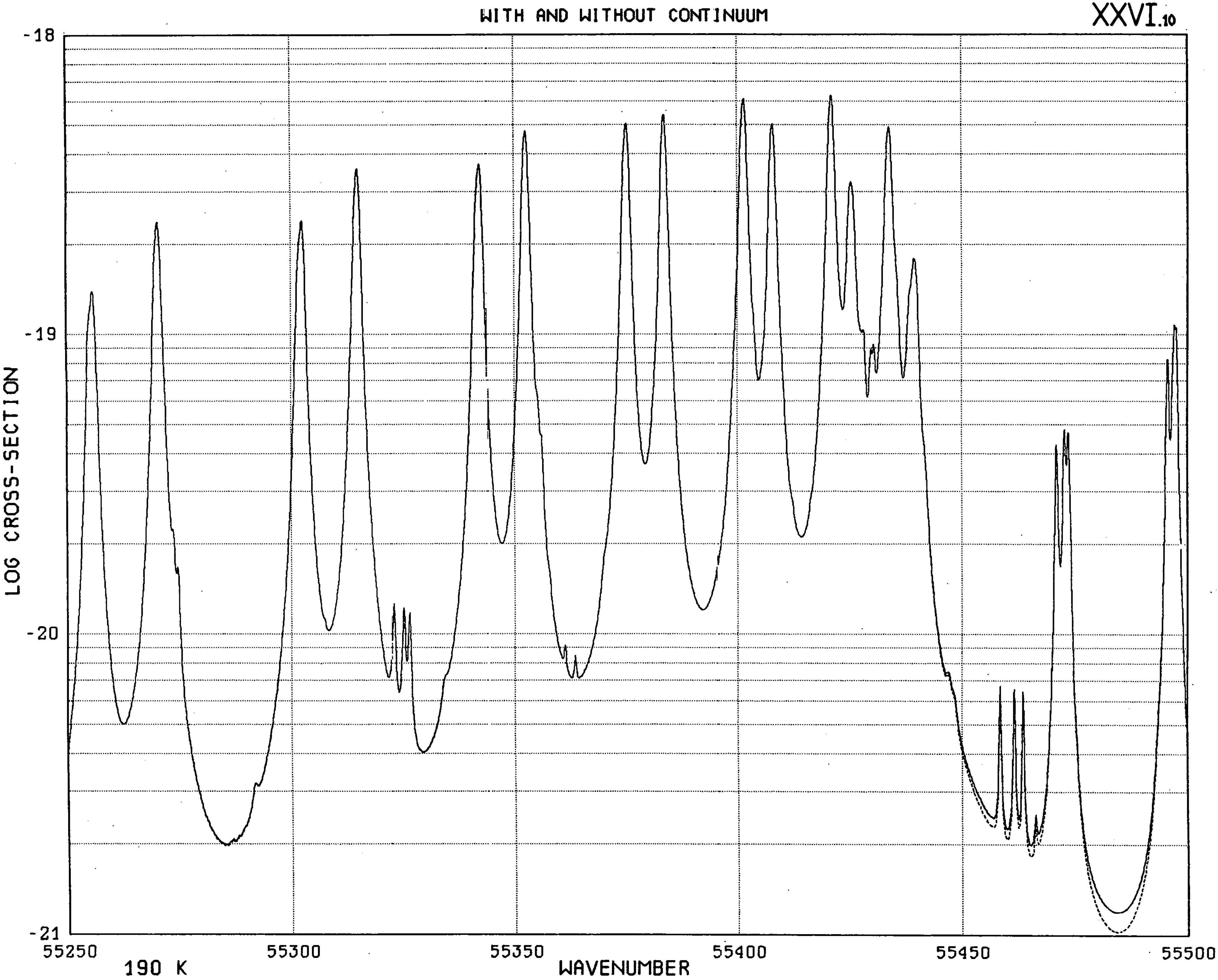

WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
LOG CROSS-SECTION
55250
55300
55350
55400
55450
55500
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
LOG CROSS-SECTION
55250
55300
55350
55400
55450
55500
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
LOG CROSS-SECTION
55250
55300
55350
55400
55450
55500
250 K
WAVENUMBER

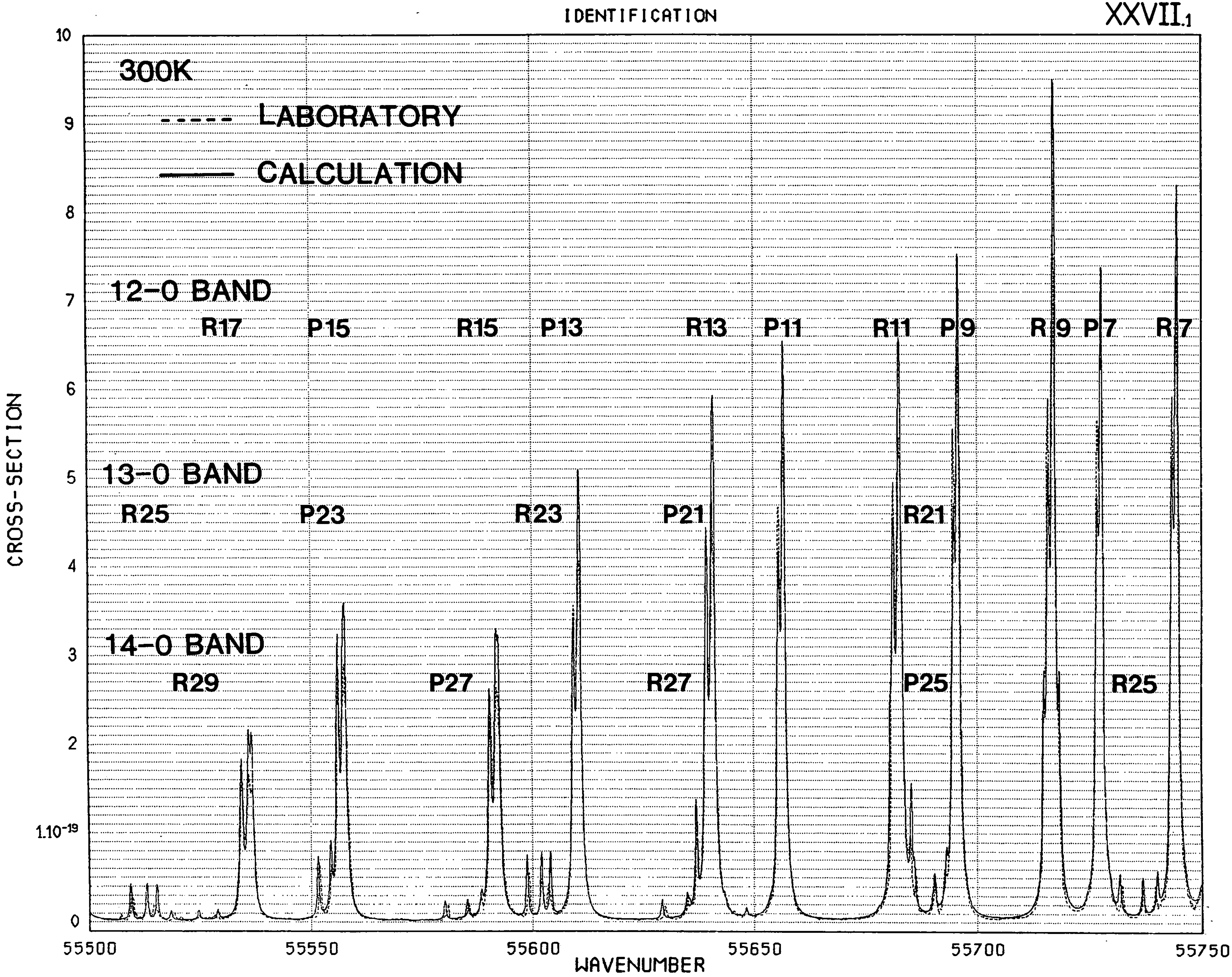

WITH AND WITHOUT CONTINUUM
XXVI.8
-18
-19
-20
-21
LOG CROSS-SECTION
55250
55300
55350
55400
55450
55500
230 K
WAVENUMBER

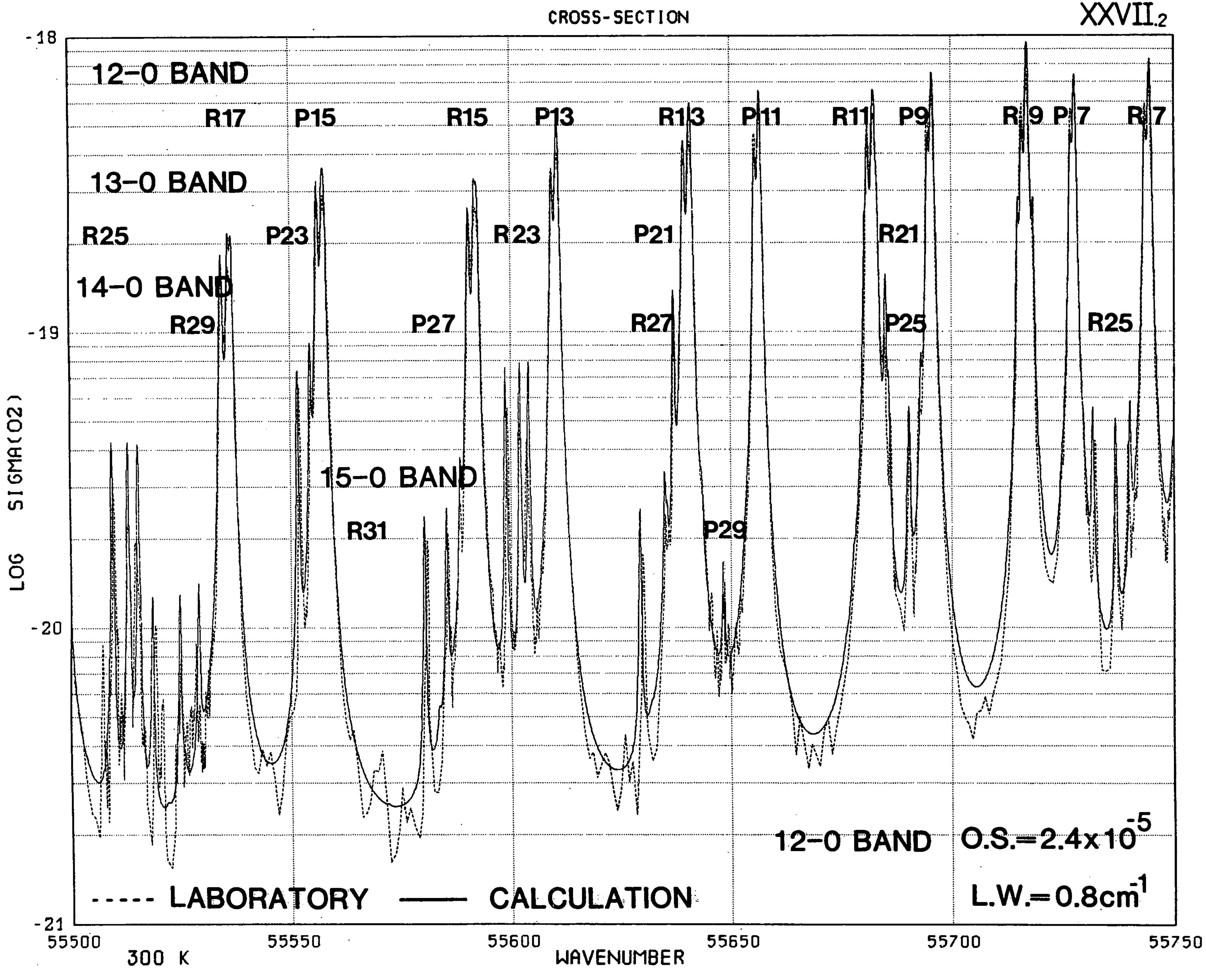

WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
LOG CROSS-SECTION
55250
55300
55350
55400
55450
55500
210 K
WAVENUMBER

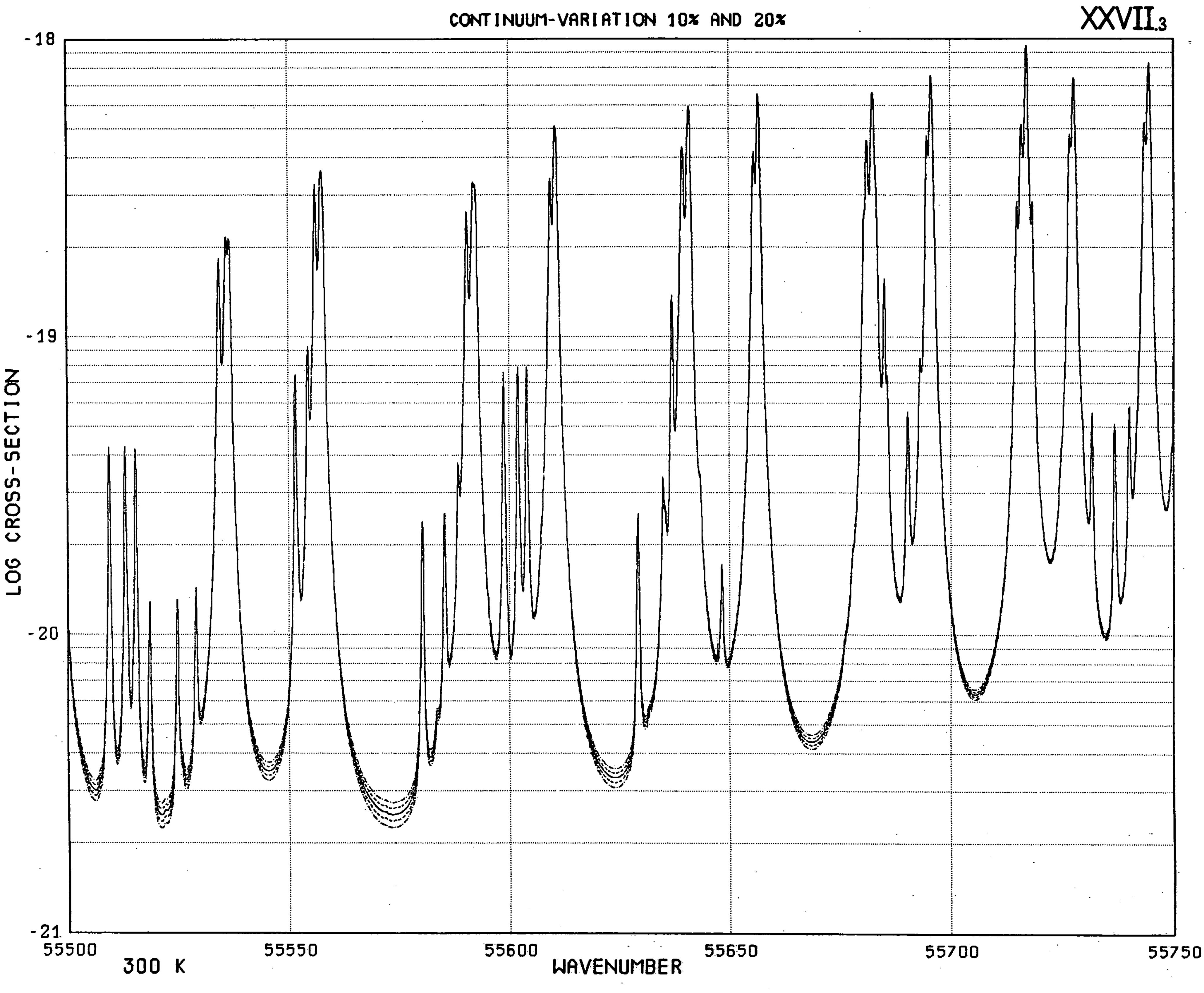

WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
LOG CROSS-SECTION
55250
55300
55350
55400
55450
55500
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
55500 - 55750 cm^{-1}

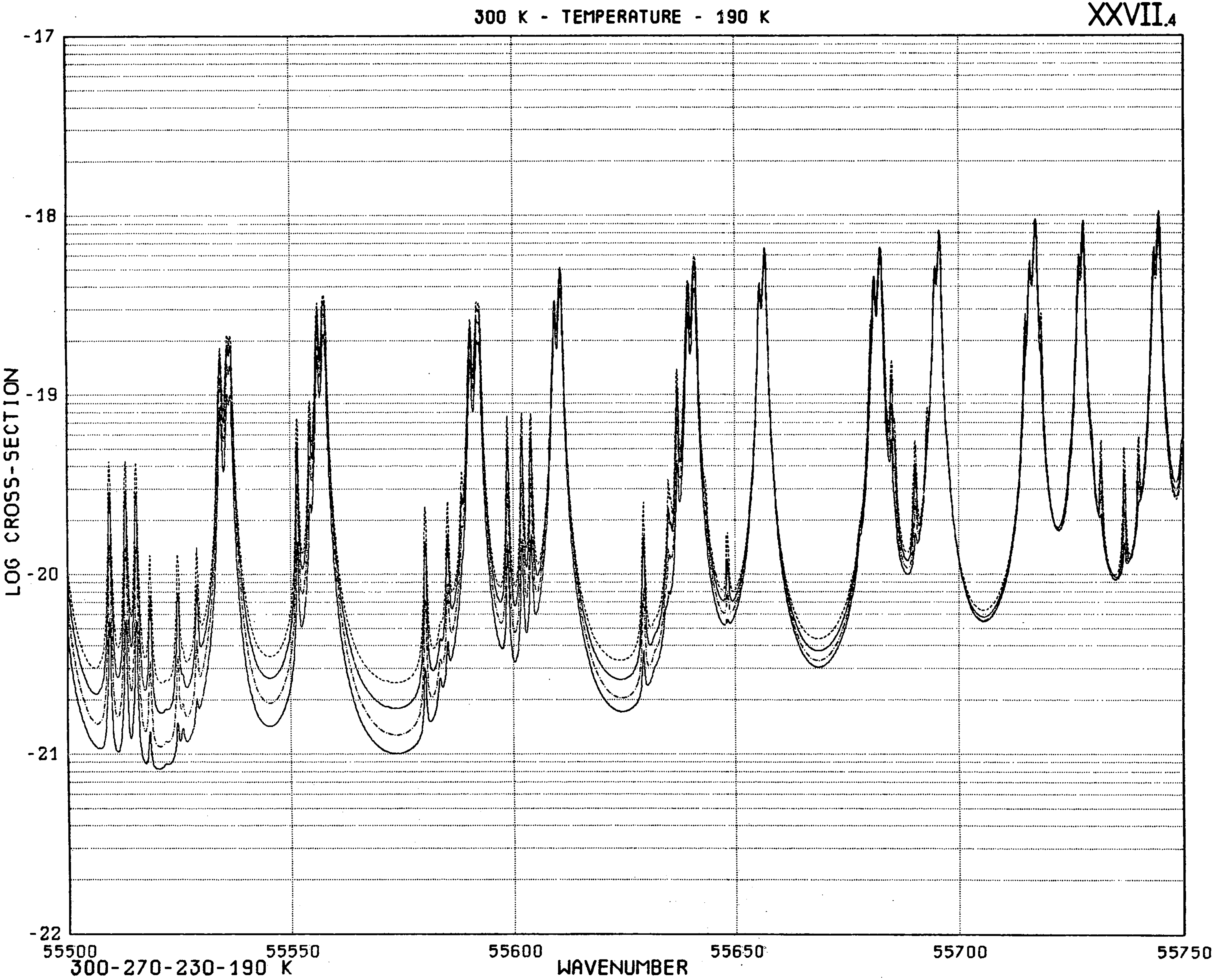
v	λ	band	v	λ	band
55500			55681.1	1795.94	12-0 R11
55509.4	1801.50	13-0 R25	55682.3	1795.90	12-0 R11
55513.0	1801.38	13-0 R25	55682.7	1795.89	12-0 R11
55515.3	1801.30	13-0 R25	55683.4	1795.87	13-0 R21
55518.5	1801.20	14-0 R29	55685.1	1795.81	13-0 R21
55524.7	1801.00	14-0 R29	55685.8	1795.79	14-0 P25
55528.9	1800.86	14-0 R29	55690.0	1795.66	15-0 R29
55534.3	1800.69	12-0 R17	55690.4	1795.64	14-0 P25
55535.9	1800.64	12-0 R17	55693.1	1795.55	14-0 P25
55536.7	1800.61	12-0 R17	55694.7	1795.50	12-0 P 9
55550			55695.7	1795.47	12-0 P 9
55551.6	1800.13	13-0 P23	55695.7	1795.47	15-0 R29
55554.4	1800.04	13-0 P23	55695.8	1795.47	12-0 P 9
55556.1	1799.98	13-0 P23	55700		
55556.1	1799.98	12-0 P15	55714.9	1794.85	13-0 P19
55557.4	1799.94	12-0 P15	55715.9	1794.82	12-0 R 9
55557.8	1799.93	12-0 P15	55717.0	1794.79	12-0 R 9
55580.2	1799.20	14-0 P27	55717.2	1794.78	13-0 P19
55585.3	1799.04	14-0 P27	55717.2	1794.78	12-0 R 9
55588.4	1798.94	14-0 P27	55718.4	1794.74	13-0 P19
55590.4	1798.87	12-0 R15	55726.8	1794.47	12-0 P 7
55591.8	1798.82	12-0 R15	55727.7	1794.44	12-0 P 7
55592.4	1798.81	12-0 R15	55727.8	1794.43	12-0 P 7
55598.8	1798.60	13-0 R23	55731.8	1794.31	14-0 R25
55600			55736.9	1794.14	14-0 R25
55602.0	1798.50	13-0 R23	55740.1	1794.04	14-0 R25
55604.0	1798.43	13-0 R23	55743.5	1793.93	12-0 R 7
55609.4	1798.26	12-0 P13	55744.5	1793.90	12-0 R 7
55610.5	1798.22	12-0 P13	55744.7	1793.89	12-0 R 7
55610.9	1798.21	12-0 P13			
55629.3	1797.62	14-0 R27			
55634.9	1797.43	14-0 R27			
55635.5	1797.41	15-0 P29			
55637.0	1797.37	13-0 P21			
55638.7	1797.31	14-0 R27			
55639.3	1797.29	12-0 R13			
55639.6	1797.28	13-0 P21			
55640.6	1797.25	12-0 R13			
55641.0	1797.24	13-0 P21			
55641.1	1797.23	12-0 R13			
55643.4	1797.16	15-0 P29			
55648.3	1797.00	15-0 P29			
55650					
55655.6	1796.76	12-0 P11			
55656.6	1796.73	12-0 P11			
55656.9	1796.72	12-0 P11			
55680.4	1795.96	13-0 R21			

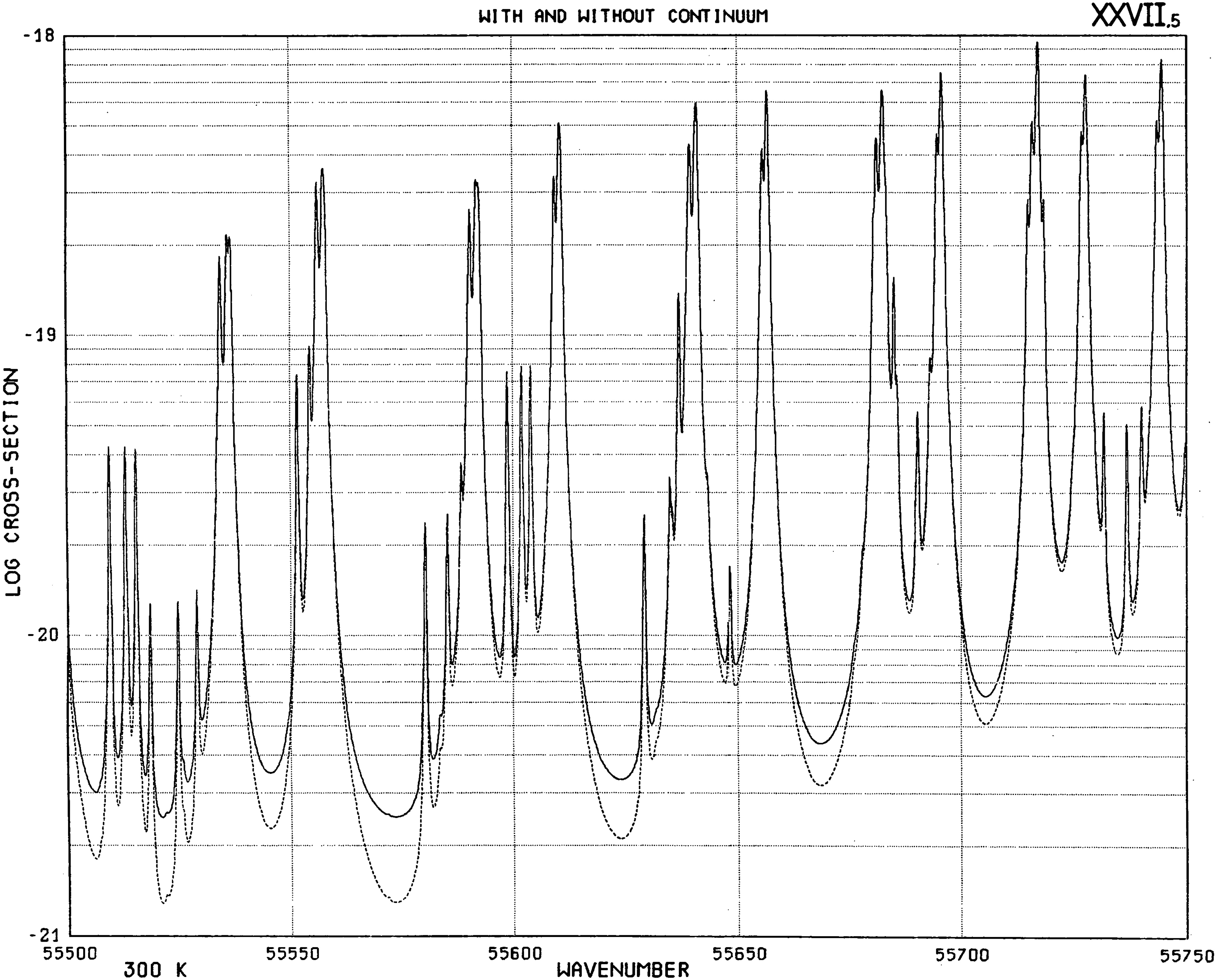

IDENTIFICATION
300K
LABORATORY
CALCULATION
12-0 BAND
R17
P15
R15
P13
R13
P11
R11
P9
R9
P7
R7
13-0 BAND
R25
P23
R23
P21
R21
14-0 BAND
R29
P27
R27
P25
R25
CROSS-SECTION
WAVENUMBER
0
1.10-19
2
3
4
5
6
7
8
9
10
55500
55550
55600
55650
55700
55750

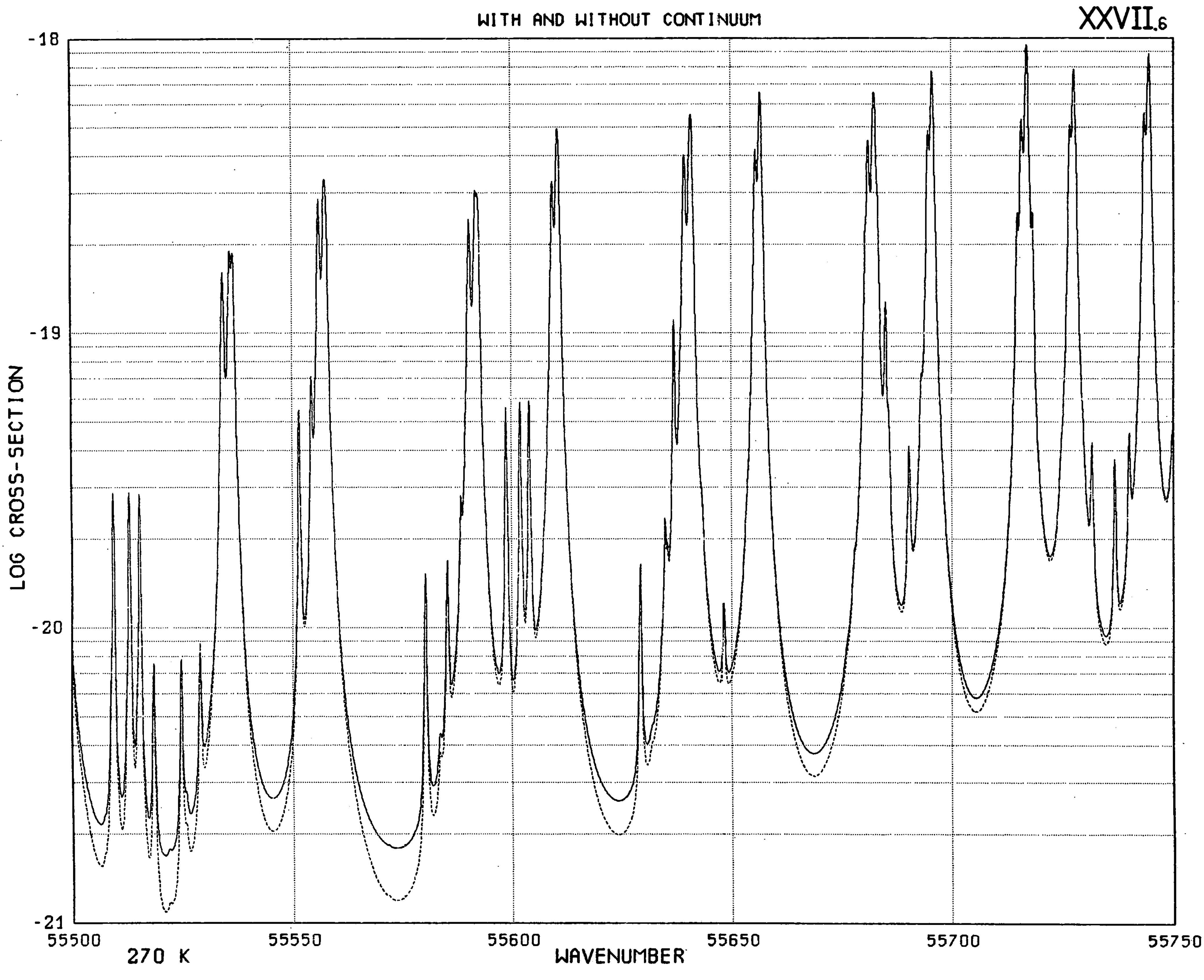

CROSS-SECTION
12-0 BAND
R17 P15 R15 P13 R13 P11 R11 P9 R9 P7 R7
13-0 BAND
R25 P23 R23 P21 R21
14-0 BAND
R29 P27 R27 P25 R25
15-0 BAND
R31 P29
12-0 BAND O.S.=2.4x10^-5
L.W.=0.8cm^-1
----- LABORATORY —— CALCULATION
LOG SIGMA(O2)
-18
-19
-20
-21
55500 55550 55600 55650 55700 55750
300 K
WAVENUMBER

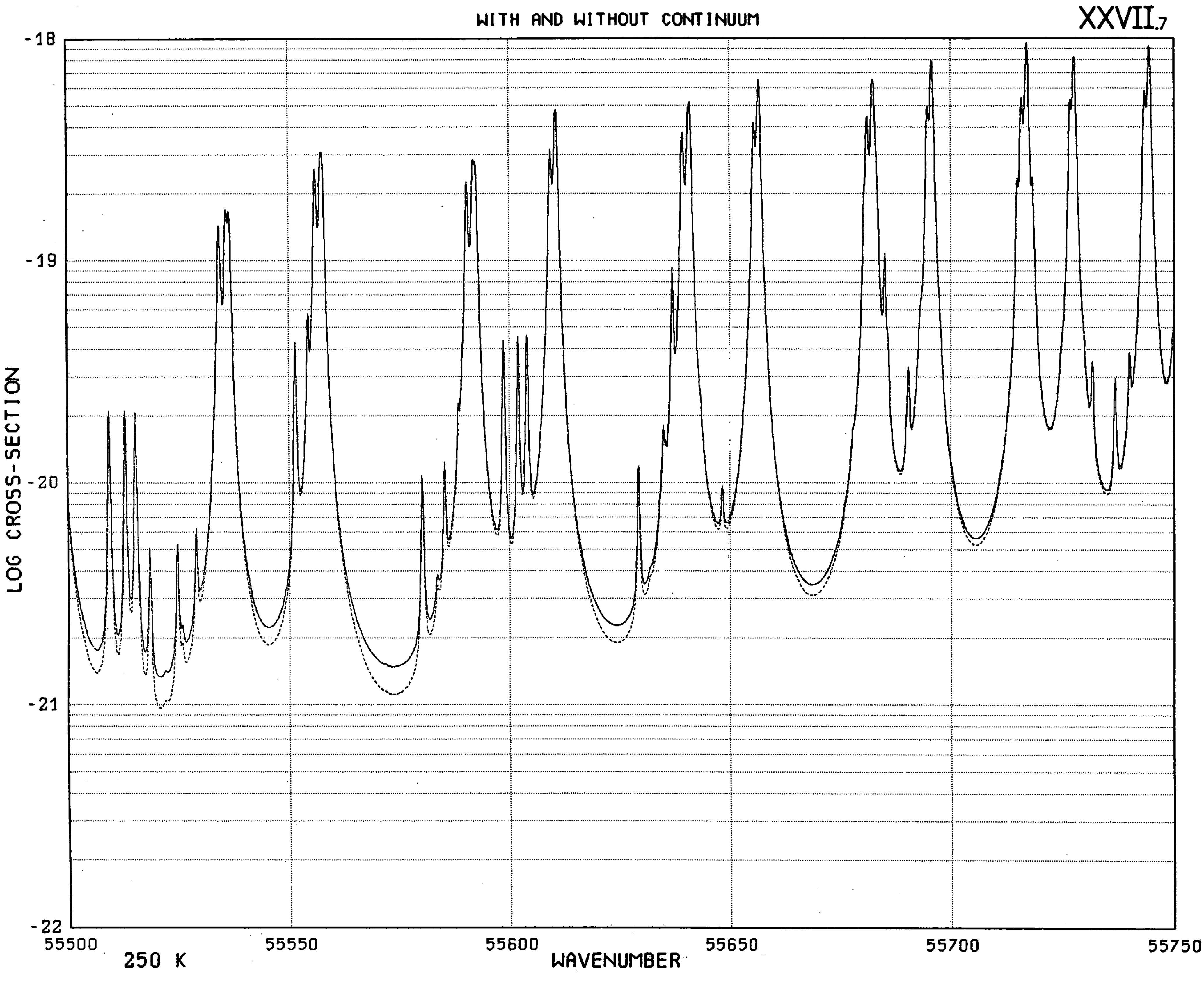


CONTINUUM-VARIATION 10% AND 20%
XXVII.3
LOG CROSS-SECTION
-18
-19
-20
-21
55500
55550
55600
55650
55700
55750
300 K
WAVENUMBER

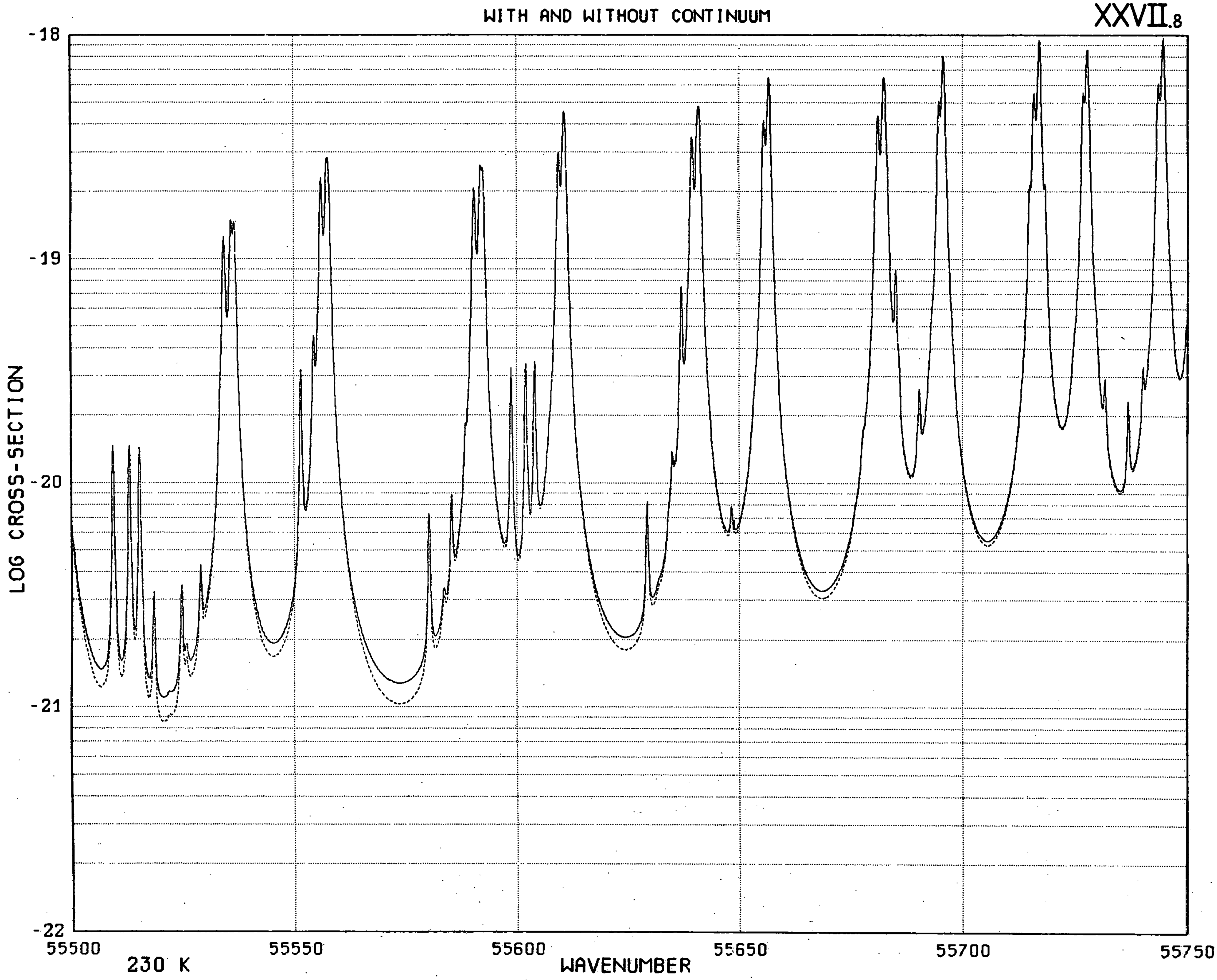

300 K - TEMPERATURE - 190 K
-17
-18
-19
-20
-21
-22
LOG CROSS-SECTION
55500
55550
55600
55650
55700
55750
WAVENUMBER
300-270-230-190 K

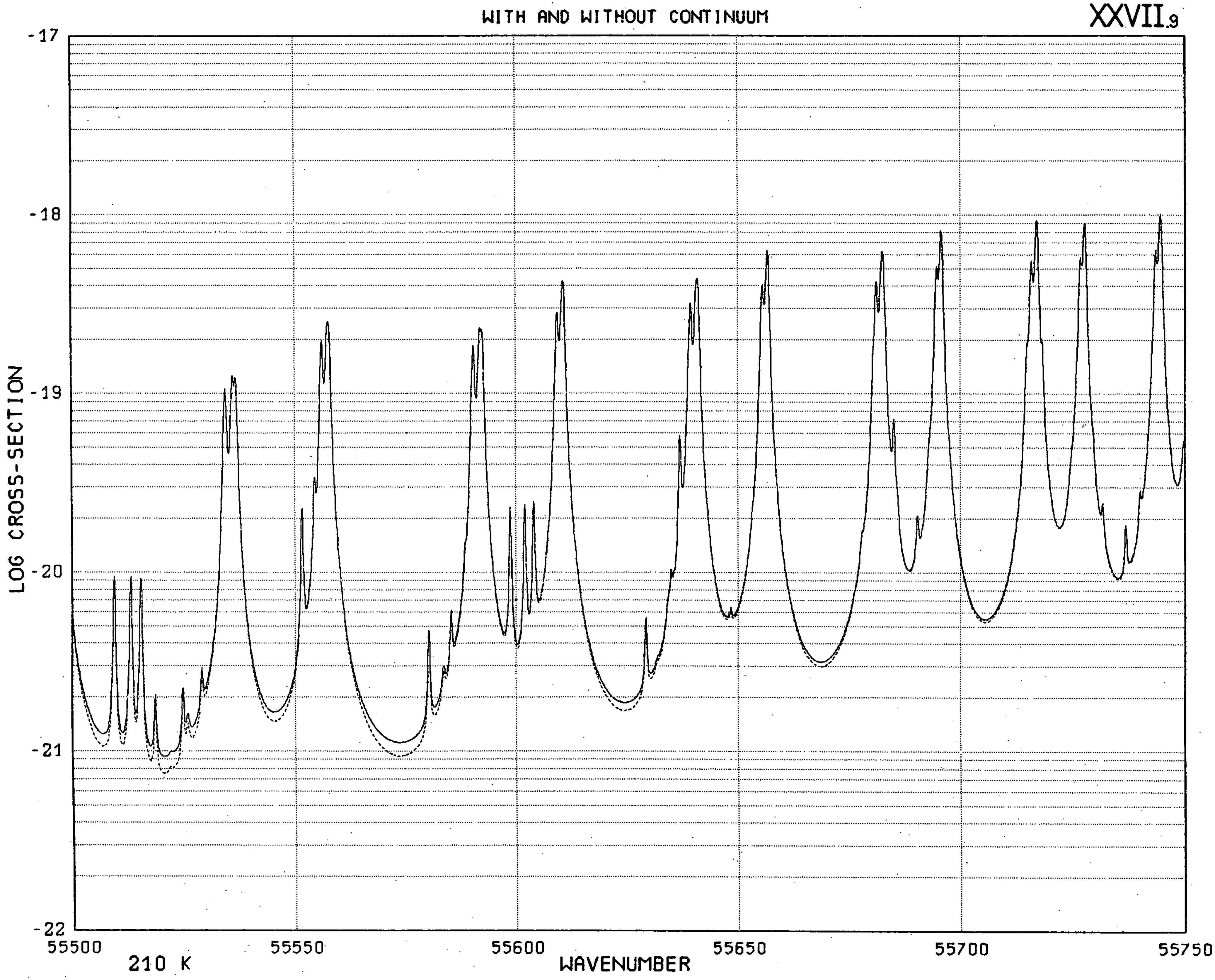

WITH AND WITHOUT CONTINUUM
-18
-19
-20
-21
LOG CROSS-SECTION
55500
55550
55600
55650
55700
55750
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
XXVII.6
LOG CROSS-SECTION
-18
-19
-20
-21
55500
55550
55600
55650
55700
55750
270 K
WAVENUMBER

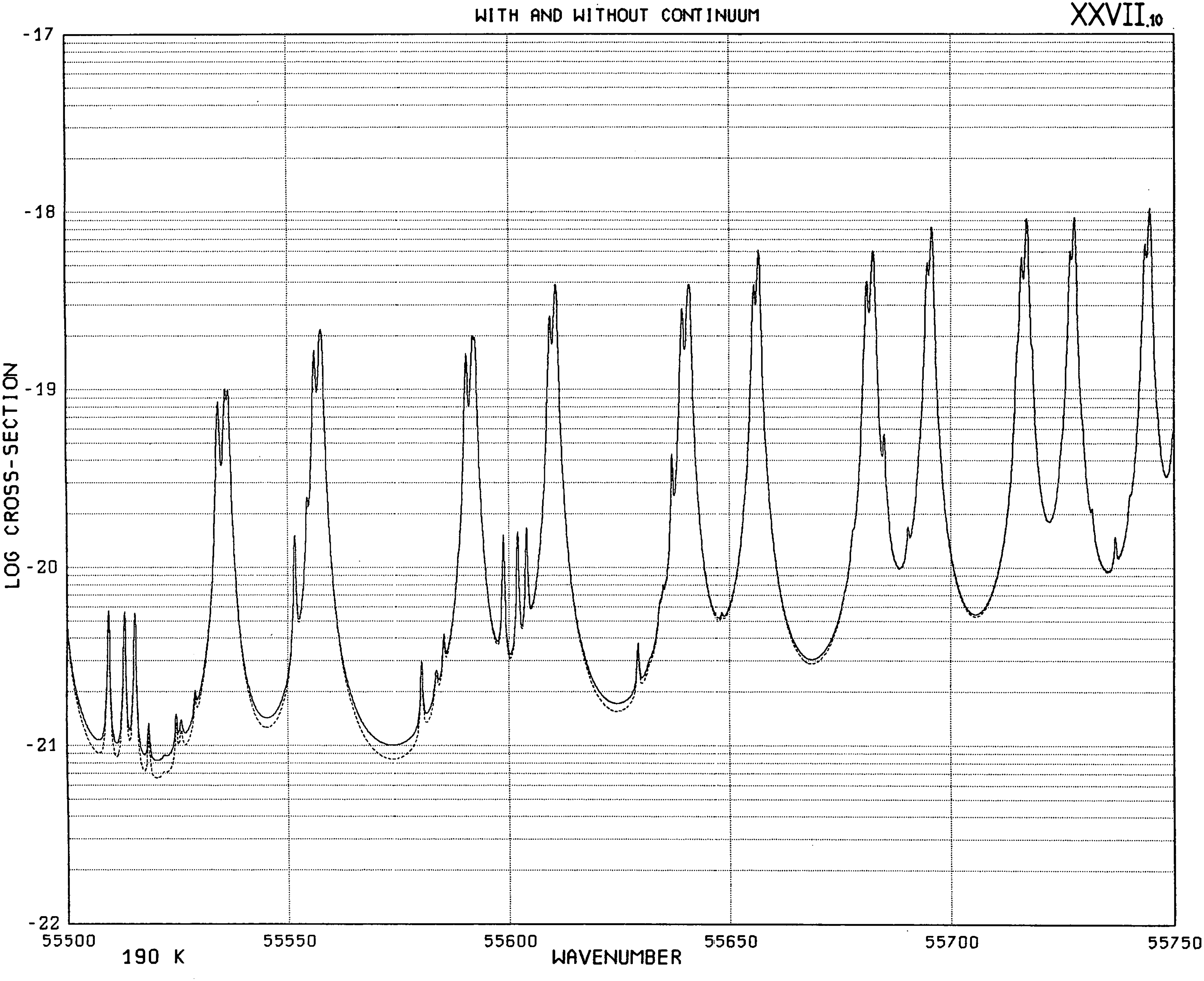


WITH AND WITHOUT CONTINUUM
XXVII.7
LOG CROSS-SECTION
-18
-19
-20
-21
-22
55500
55550
55600
55650
55700
55750
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-18
-19
-20
-21
-22
55500
55550
55600
55650
55700
55750
230 K
WAVENUMBER

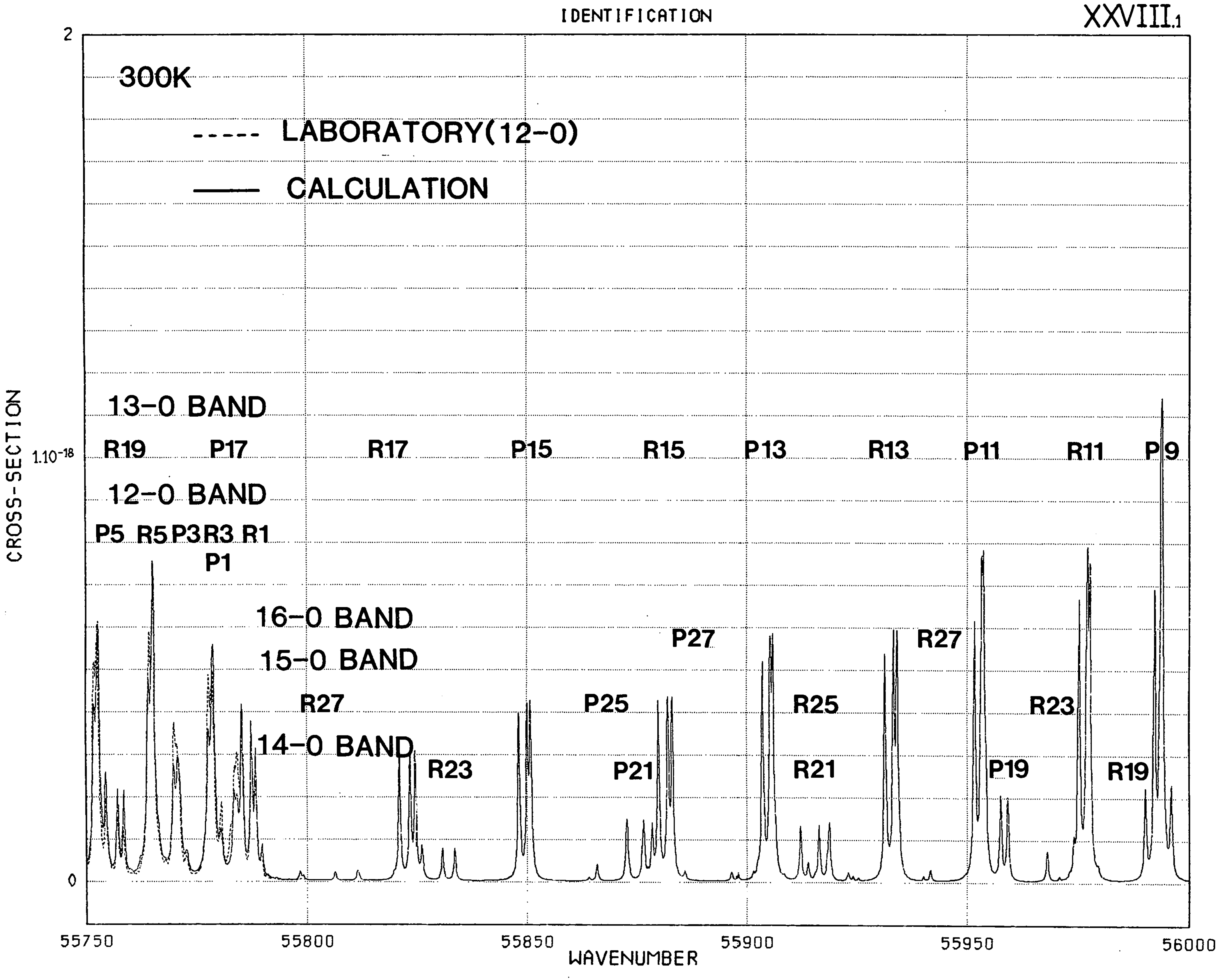

WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
-22
LOG CROSS-SECTION
55500
55550
55600
55650
55700
55750
210 K
WAVENUMBER

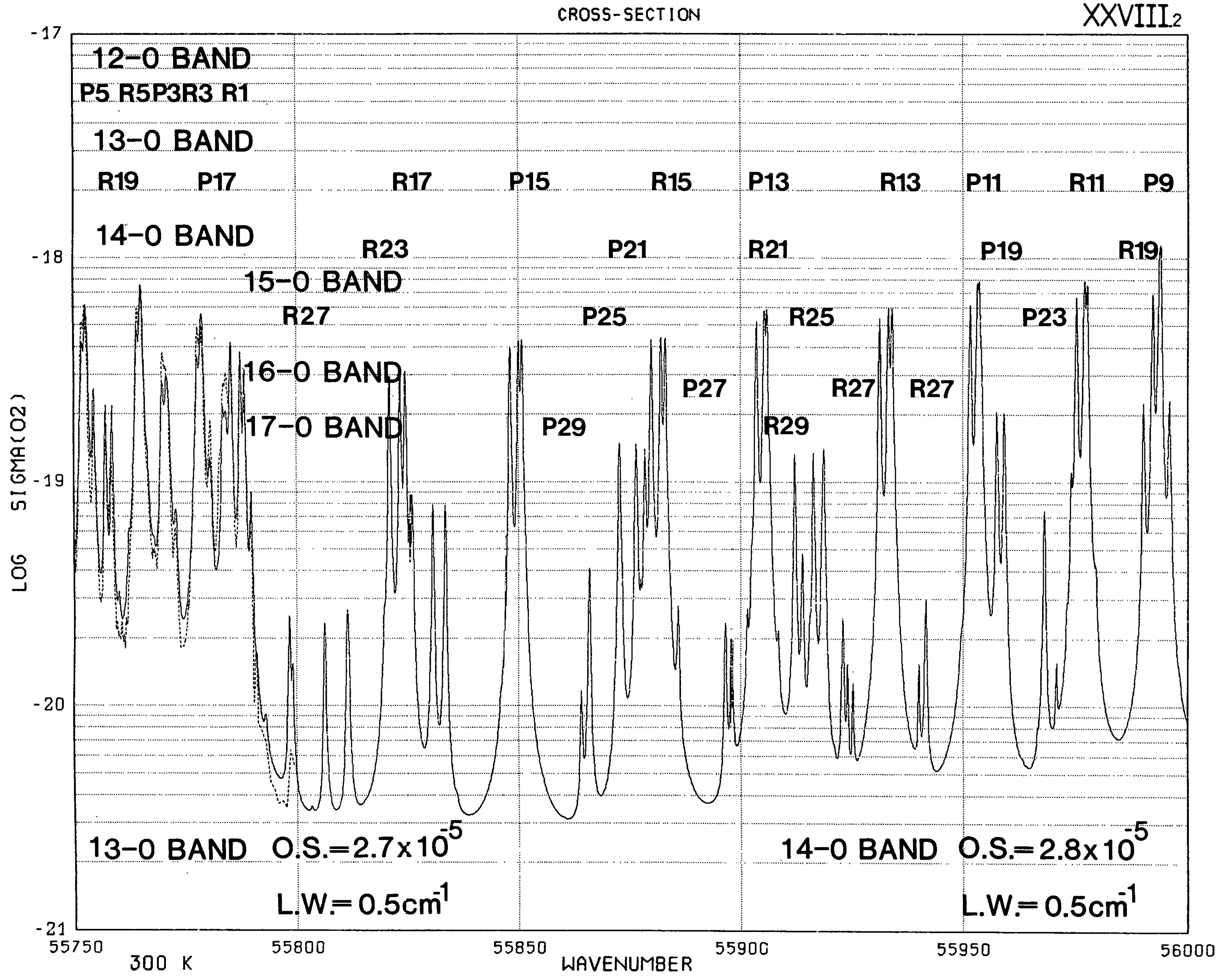
XXVII.10


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-17
-18
-19
-20
-21
-22
55500
55550
55600
55650
55700
55750
190 K
WAVENUMBER

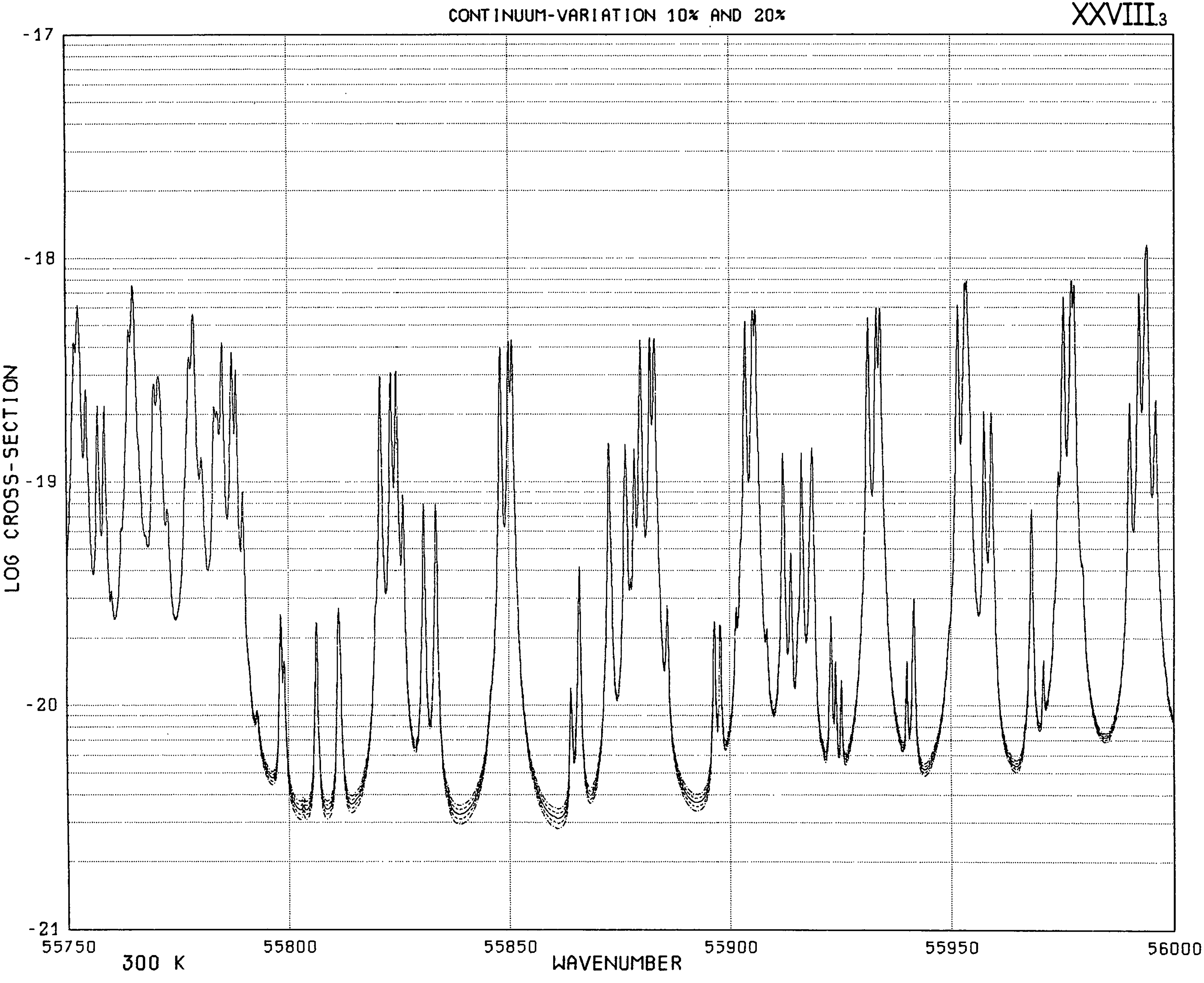
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
55750 - 56000 cm^{-1}

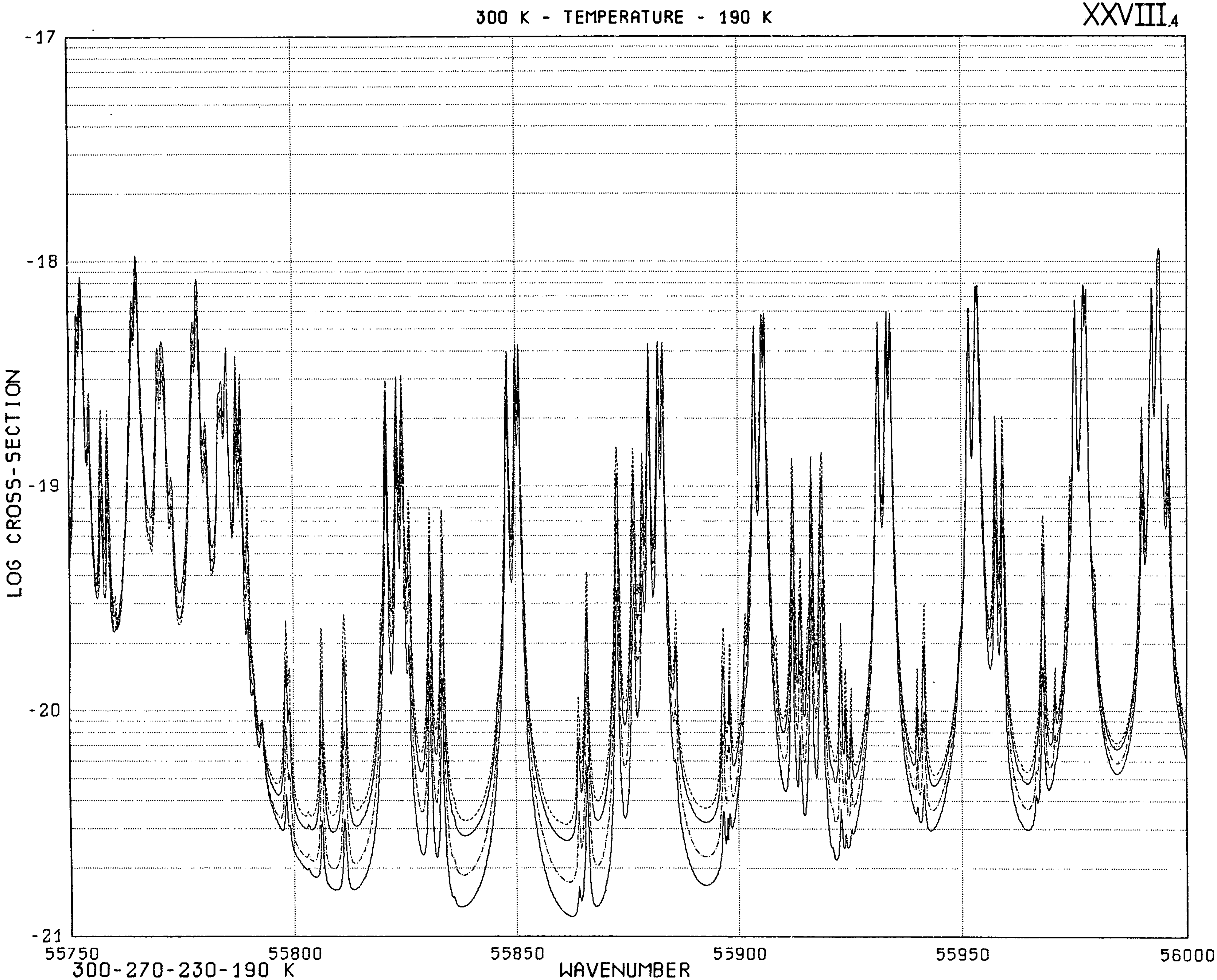
v	λ	band
55750		
55751.8	1793.66	12-0 P 5
55752.7	1793.63	12-0 P 5
55752.9	1793.63	12-0 P 5
55754.5	1793.58	13-0 R19
55755.1	1793.56	15-0 P27
55757.1	1793.49	13-0 R19
55758.6	1793.45	13-0 R19
55760.1	1793.40	16-0 P29
55762.3	1793.33	15-0 P27
55764.1	1793.27	12-0 R 5
55765.1	1793.24	12-0 R 5
55765.3	1793.23	12-0 R 5
55766.5	1793.19	15-0 P27
55769.8	1793.09	12-0 P 3
55770.7	1793.06	12-0 P 3
55771.2	1793.04	12-0 P 3
55771.7	1793.02	16-0 P29
55777.7	1792.83	12-0 R 3
55778.5	1792.80	16-0 P29
55778.6	1792.80	12-0 R 3
55778.8	1792.79	12-0 R 3
55780.5	1792.74	12-0 P 1
55783.3	1792.65	14-0 P23
55783.5	1792.65	12-0 Q 1
55784.1	1792.63	12-0 R 1
55785.1	1792.59	12-0 R 1
55785.2	1792.59	13-0 P17
55787.4	1792.52	13-0 P17
55788.3	1792.49	13-0 P17
55789.8	1792.44	14-0 P23
55798.3	1792.17	15-0 R27
55800		
55806.3	1791.91	15-0 R27
55811.4	1791.75	15-0 R27
55811.8	1791.74	16-0 R29
55819.7	1791.48	16-0 R29
55820.9	1791.44	13-0 R17
55823.3	1791.37	13-0 R17
55824.6	1791.33	13-0 R17
55826.1	1791.28	14-0 R23
55830.7	1791.13	14-0 R23
55833.5	1791.04	14-0 R23
55848.0	1790.58	17-0 P29
55850		
55850.0	1790.51	13-0 P15
55850.8	1790.48	13-0 P15
55864.1	1790.06	17-0 P29
55865.9	1790.00	15-0 P25
55872.5	1789.79	15-0 P25
55872.8	1789.78	14-0 P21
55873.2	1789.77	17-0 P29
55876.2	1789.67	15-0 P25
55876.5	1789.66	14-0 P21
55877.5	1789.63	18-0 P29
55878.5	1789.60	14-0 P21
55879.9	1789.55	13-0 R15
55882.1	1789.48	13-0 R15
55883.1	1789.45	13-0 R15
55885.9	1789.36	16-0 P27
55896.5	1789.02	16-0 P27
55897.9	1788.98	18-0 R29
55898.0	1788.97	17-0 R29
55900		
55901.5	1788.86	18-0 P29
55902.5	1788.83	16-0 P27
55903.6	1788.79	13-0 P13
55905.3	1788.74	13-0 P13
55905.9	1788.72	13-0 P13
55906.6	1788.70	15-0 R25
55908.5	1788.64	17-0 R29
55912.2	1788.52	14-0 R21
55913.9	1788.46	15-0 R25
55915.5	1788.41	18-0 P29
55916.4	1788.38	14-0 R21
55918.3	1788.32	15-0 R25
55918.8	1788.31	14-0 R21
55923.0	1788.17	16-0 R27
55924.1	1788.14	18-0 R29
55925.3	1788.10	19-0 P29
55931.4	1787.91	13-0 R13
55933.3	1787.84	13-0 R13
55934.1	1787.82	13-0 R13
55934.7	1787.80	16-0 R27
55940.1	1787.63	18-0 R29
55941.6	1787.58	16-0 R27
55941.8	1787.57	19-0 R29
55950		
55951.7	1787.26	13-0 P11
55953.2	1787.21	13-0 P11
55953.7	1787.19	13-0 P11
55954.2	1787.18	14-0 P19
55954.3	1787.17	19-0 P29
55957.6	1787.07	14-0 P19
55959.2	1787.02	14-0 P19
55968.2	1786.73	15-0 P23
55970.9	1786.64	19-0 P29
55973.2	1786.57	19-0 R29
55974.2	1786.54	15-0 P23
55975.4	1786.50	13-0 R11
55977.1	1786.44	13-0 R11
55977.3	1786.44	15-0 P23
55977.8	1786.42	13-0 R11
55979.7	1786.36	17-0 P27
55990.2	1786.03	14-0 R19
55992.2	1785.96	19-0 R29
55992.3	1785.96	13-0 P 9
55993.8	1785.91	13-0 P 9
55994.1	1785.90	13-0 P 9
55994.1	1785.90	14-0 R19
55994.5	1785.89	17-0 P27
55996.1	1785.84	14-0 R19

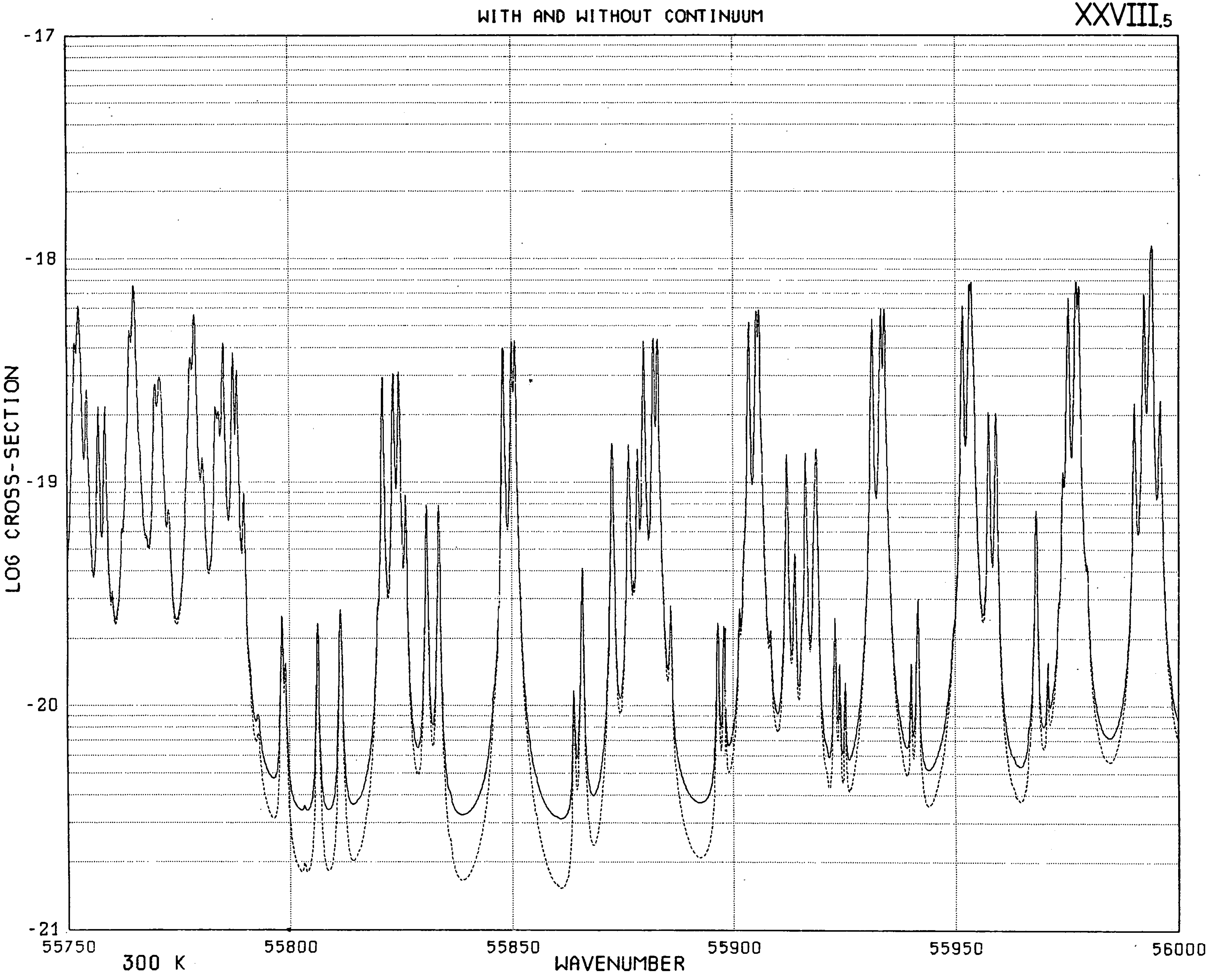

IDENTIFICATION
300K
----- LABORATORY(12-0)
—— CALCULATION
13-0 BAND
R19 P17 R17 P15 R15 P13 R13 P11 R11 P9
12-0 BAND
P5 R5 P3 R3 R1
P1
16-0 BAND
P27 R27
15-0 BAND
R27 P25 R25 R23
14-0 BAND
R23 P21 R21 P19 R19
CROSS-SECTION
2
1.10-18
0
55750 55800 55850 55900 55950 56000
WAVENUMBER

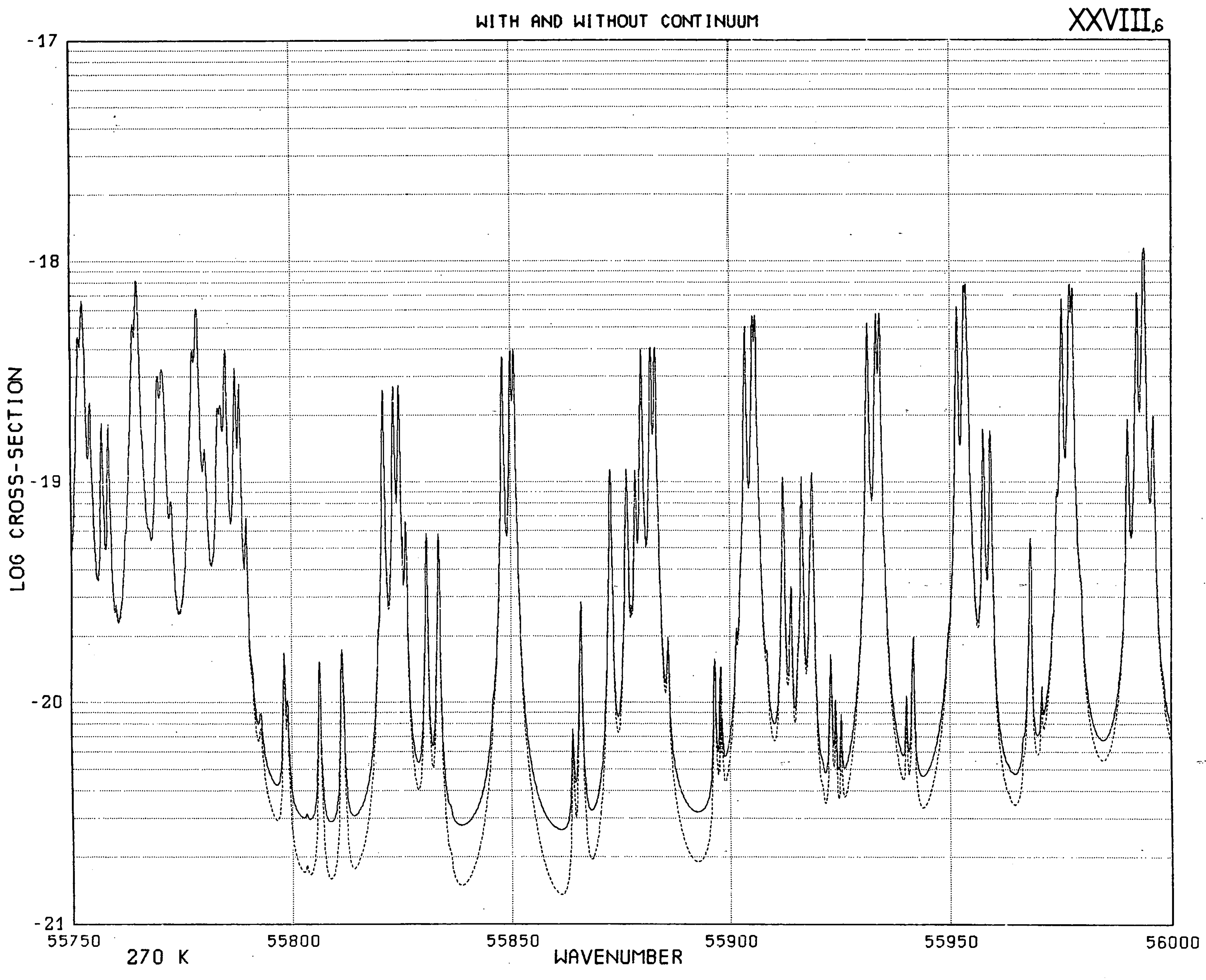


CROSS-SECTION
12-0 BAND
P5 R5P3R3 R1
13-0 BAND
R19 P17 R17 P15 R15 P13 R13 P11 R11 P9
14-0 BAND
R23 P21 R21 P19 R19
15-0 BAND
R27 P25 R25 P23
16-0 BAND
P27 R27 R27
17-0 BAND
P29 R29
13-0 BAND O.S.=2.7x10^-5
L.W.=0.5cm^-1
14-0 BAND O.S.=2.8x10^-5
L.W.=0.5cm^-1
-17
-18
-19
-20
-21
LOG SIGMA(O2)
55750
55800
55850
55900
55950
56000
300 K
WAVENUMBER

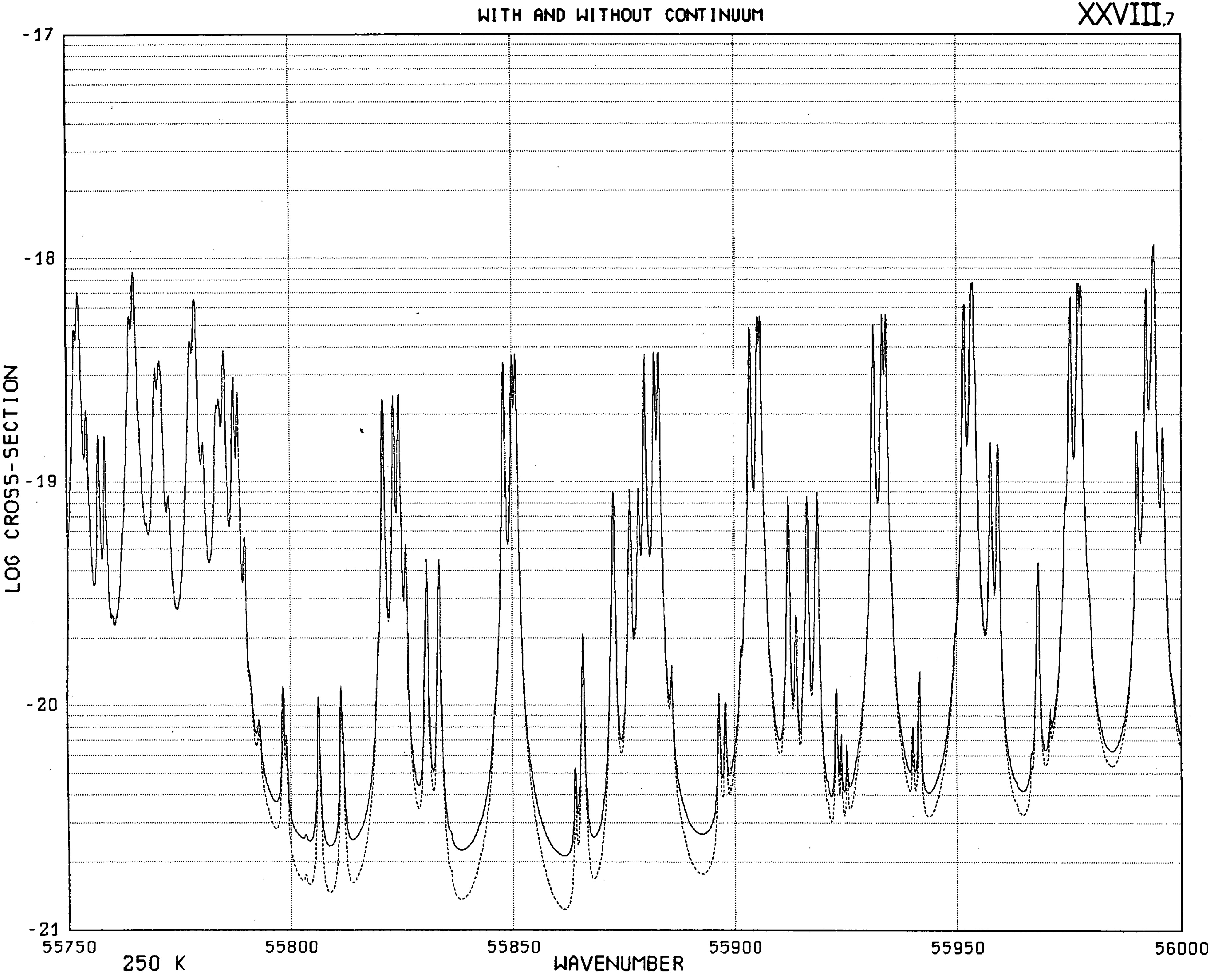

CONTINUUM-VARIATION 10% AND 20%
-17
-18
-19
-20
-21
LOG CROSS-SECTION
55750
55800
55850
55900
55950
56000
300 K
WAVENUMBER

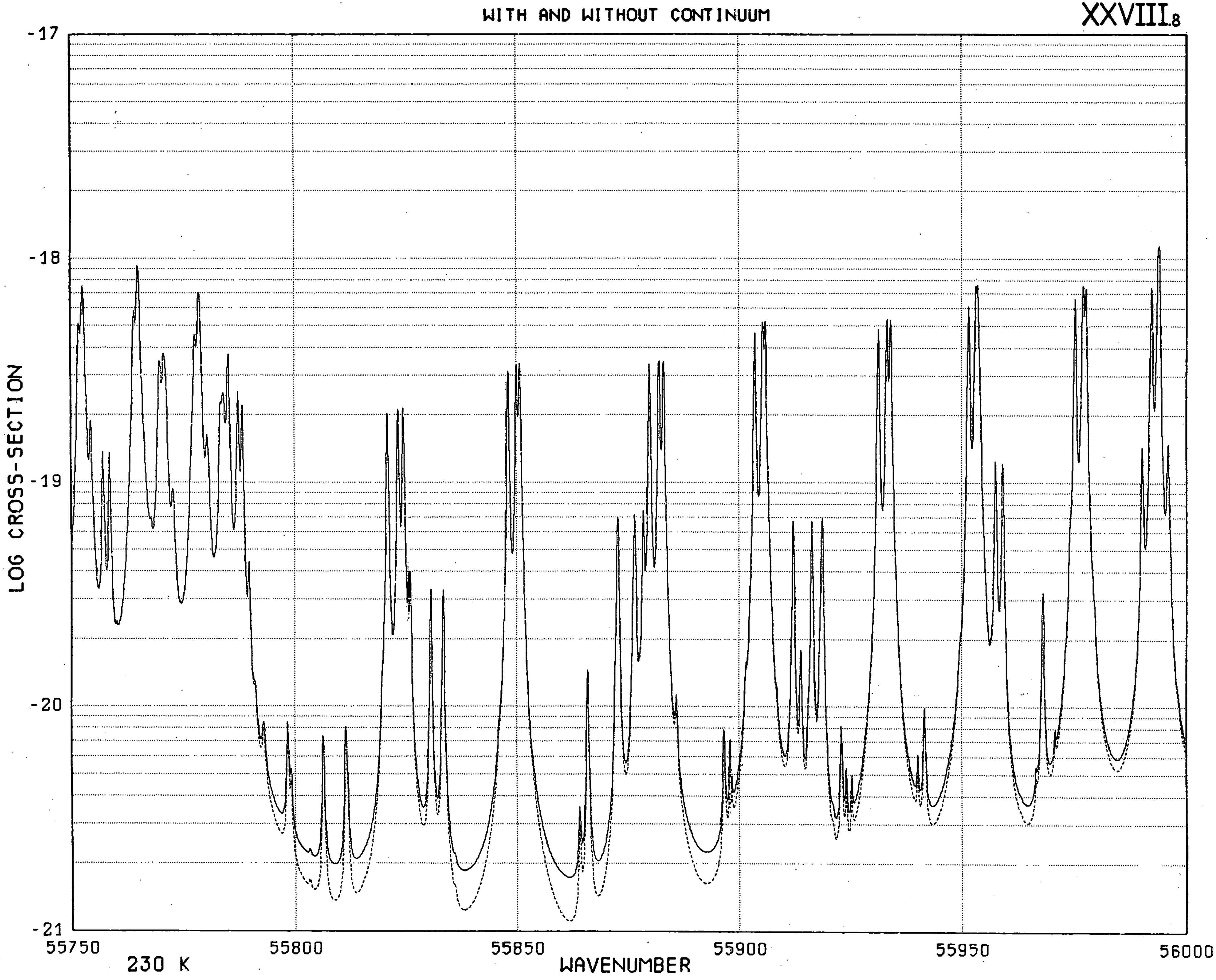

300 K - TEMPERATURE - 190 K
-17
-18
-19
-20
-21
LOG CROSS-SECTION
55750
55800
55850
55900
55950
56000
WAVENUMBER
300-270-230-190 K

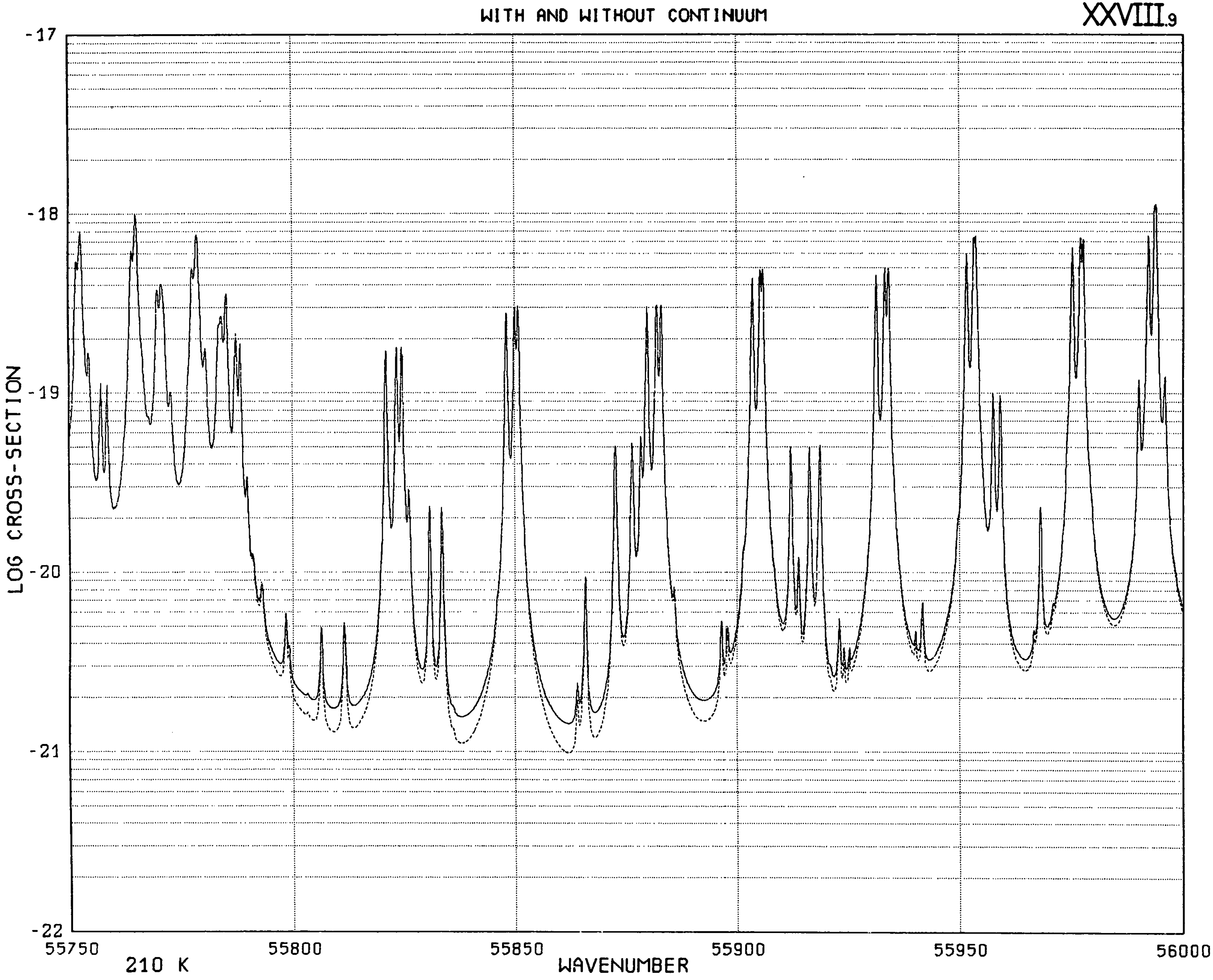

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-17
-18
-19
-20
-21
55750
55800
55850
55900
55950
56000
300 K
WAVENUMBER

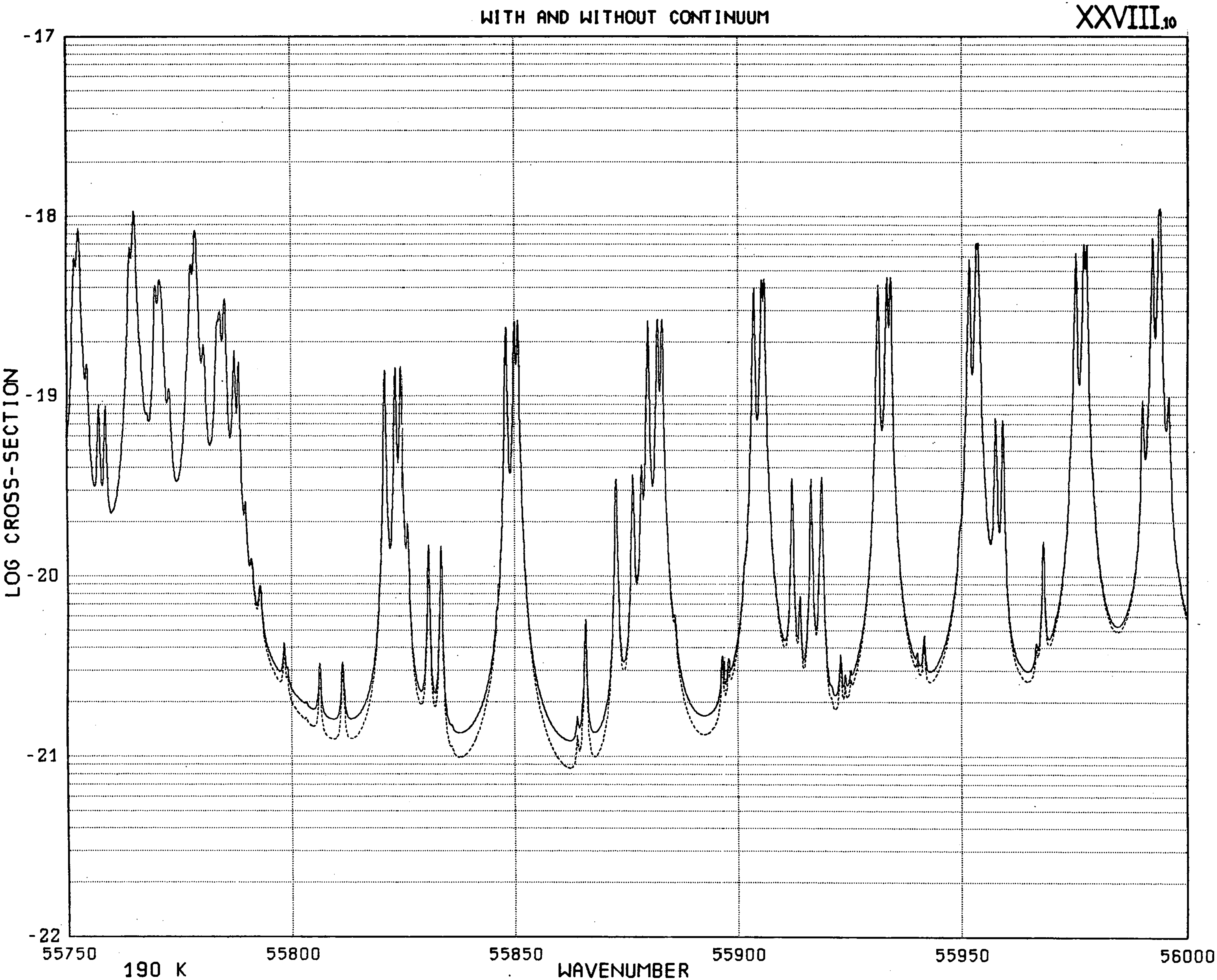


WITH AND WITHOUT CONTINUUM
XXVIII.6
LOG CROSS-SECTION
-17
-18
-19
-20
-21
55750
55800
55850
55900
55950
56000
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
55750
55800
55850
55900
55950
56000
WAVENUMBER
250 K


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-17
-18
-19
-20
-21
55750
55800
55850
55900
55950
56000
230 K
WAVENUMBER

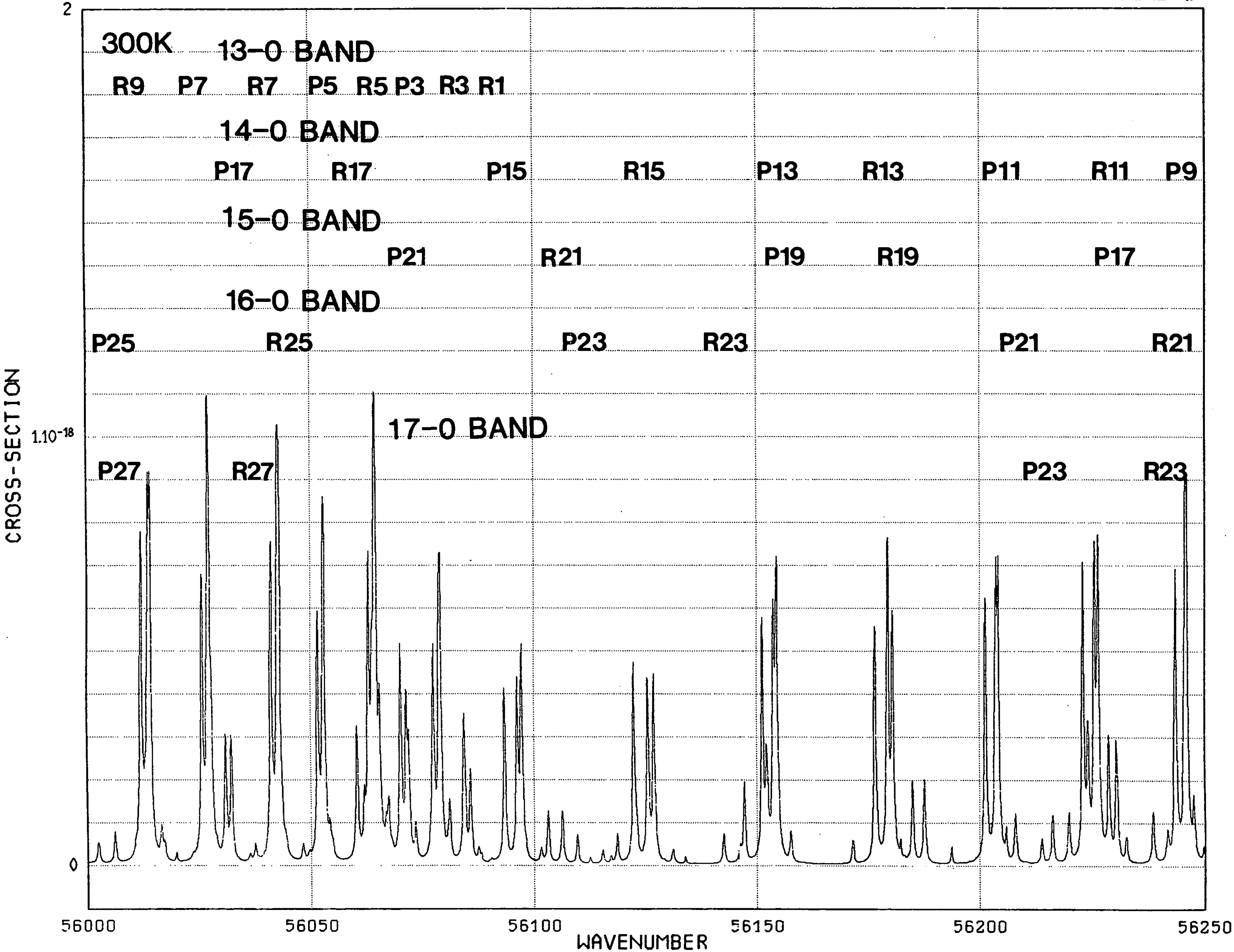

WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
-22
LOG CROSS-SECTION
55750
55800
55850
55900
55950
56000
210 K
WAVENUMBER

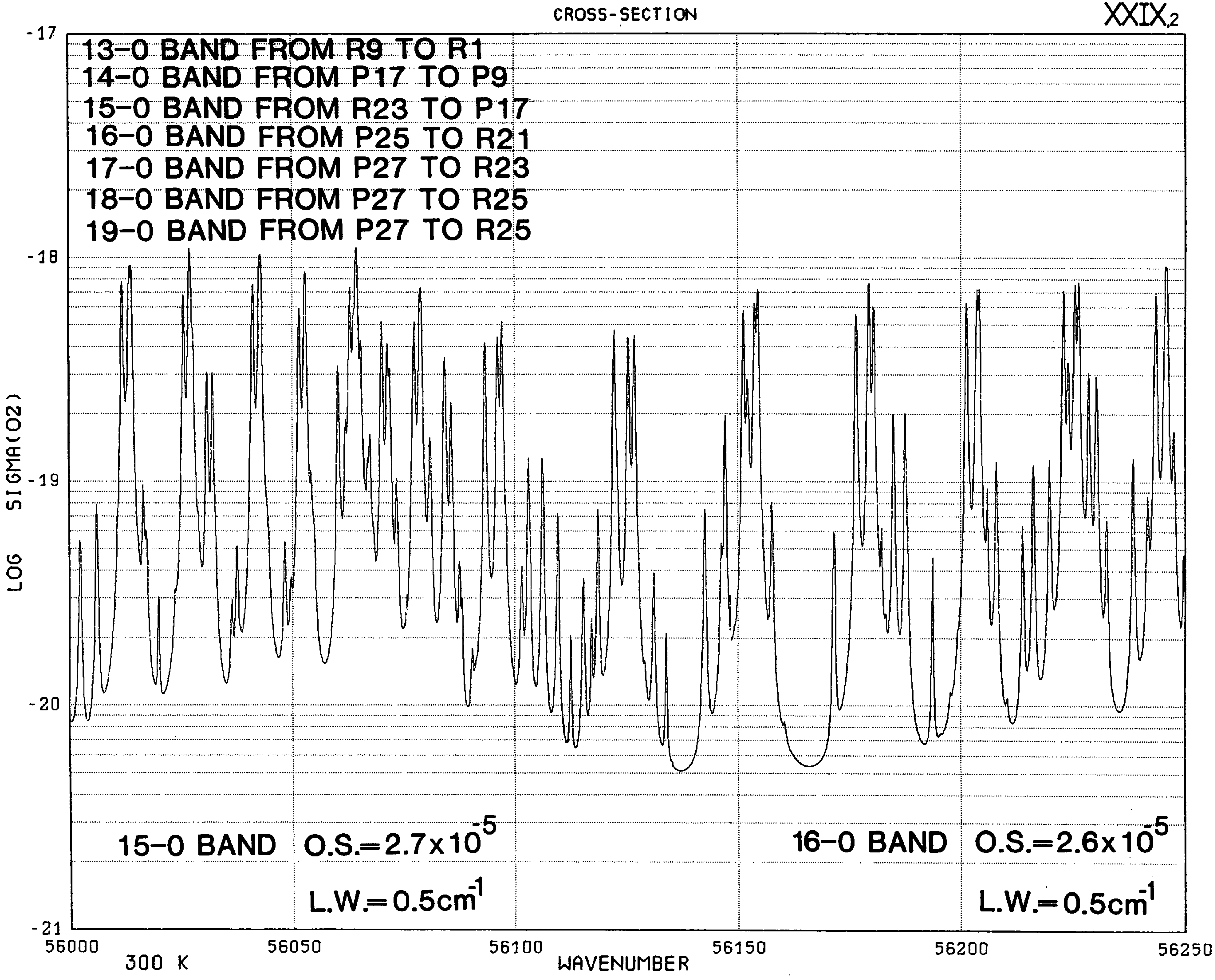

WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
-22
LOG CROSS-SECTION
55750
55800
55850
55900
55950
56000
190 K
WAVENUMBER

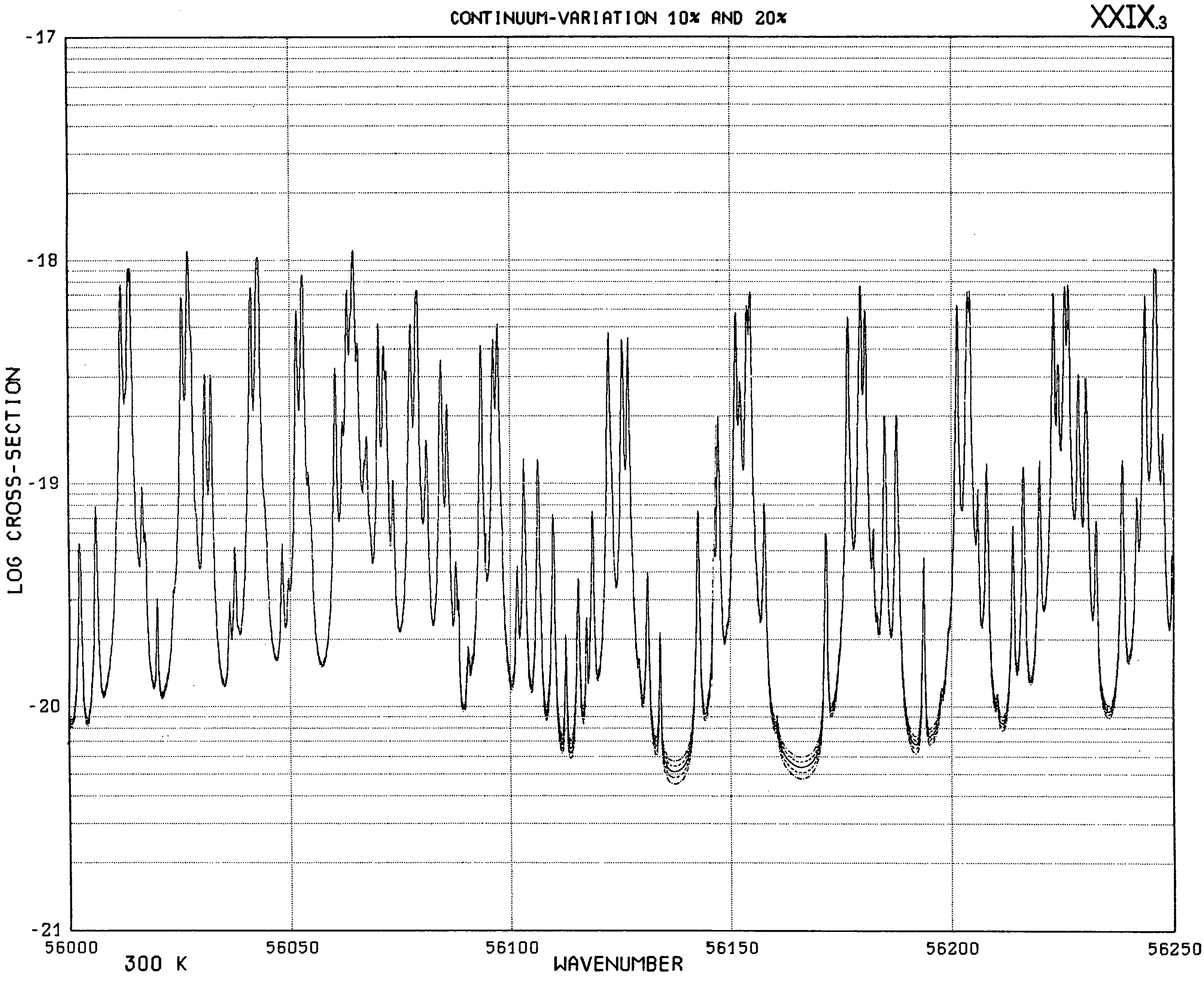
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
56000 - 56250 cm^{-1}

v	λ	band	v	λ	band	v	λ	band
56000								
56002.4	1785.64	16-0 P25	56081.0	1783.13	13-0 P 1	56193.7	1779.56	18-0 R25
56002.6	1785.63	17-0 P27	56084.2	1783.03	13-0 Q 1	56200		
56006.1	1785.52	15-0 R23	56084.4	1783.03	13-0 R 1	56201.3	1779.32	14-0 P11
56010.8	1785.37	17-0 R27	56085.7	1782.99	13-0 R 1	56203.6	1779.24	14-0 P11
56012.2	1785.33	16-0 P25	56088.2	1782.91	19-0 R27	56204.2	1779.23	14-0 P11
56012.8	1785.30	15-0 R23	56093.4	1782.74	14-0 P15	56205.9	1779.17	19-0 P25
56014.0	1785.27	13-0 R 9	56096.2	1782.65	14-0 P15	56206.0	1779.17	18-0 R25
56016.6	1785.18	15-0 R23	56097.0	1782.63	15-0 R21	56208.0	1779.10	16-0 P21
56017.3	1785.16	16-0 P25	56097.2	1782.62	14-0 P15	56213.9	1778.92	17-0 P23
56019.9	1785.08	18-0 P27	56098.1	1782.59	19-0 P27	56216.3	1778.85	16-0 P21
56025.6	1784.90	13-0 P 7	56100			56219.9	1778.73	16-0 P21
56026.9	1784.86	13-0 P 7	56101.6	1782.48	17-0 P25	56222.9	1778.64	19-0 R25
56027.1	1784.85	17-0 R27	56103.1	1782.43	15-0 R21	56224.1	1778.60	15-0 P17
56027.2	1784.85	13-0 P 7	56106.3	1782.33	15-0 R21	56225.6	1778.55	14-0 R11
56027.8	1784.83	14-0 P17	56109.7	1782.22	16-0 P23	56226.4	1778.52	14-0 R11
56030.8	1784.73	14-0 P17	56112.6	1782.13	19-0 P27	56226.7	1778.51	17-0 P23
56032.1	1784.69	14-0 P17	56115.4	1782.04	17-0 P25	56228.7	1778.45	15-0 P17
56036.3	1784.56	17-0 R27	56117.3	1781.98	19-0 R27	56230.4	1778.40	15-0 P17
56037.5	1784.52	16-0 R25	56118.7	1781.94	16-0 P23	56230.7	1778.39	19-0 P25
56040.4	1784.43	18-0 R27	56122.4	1781.82	17-0 P25	56232.7	1778.33	17-0 P23
56041.2	1784.40	13-0 R 7	56122.4	1781.82	14-0 R15	56238.6	1778.14	16-0 R21
56042.0	1784.38	18-0 P27	56123.0	1781.80	16-0 P23	56241.8	1778.04	17-0 R23
56042.6	1784.36	13-0 R 7	56125.5	1781.72	14-0 R15	56243.3	1777.99	19-0 P25
56043.0	1784.35	13-0 R 7	56126.9	1781.68	14-0 R15	56243.7	1777.98	14-0 P 9
56048.2	1784.18	16-0 R25	56131.2	1781.54	17-0 R25	56245.8	1777.91	14-0 P 9
56050			56134.0	1781.45	19-0 R27	56246.1	1777.90	14-0 P 9
56051.6	1784.07	13-0 P 5	56142.6	1781.18	16-0 R23	56247.6	1777.85	16-0 R21
56052.8	1784.03	13-0 P 5	56146.3	1781.06	17-0 R25	56249.8	1777.79	19-0 R25
56053.0	1784.02	13-0 P 5	56147.2	1781.03	15-0 P19			
56054.2	1783.99	16-0 R25	56150					
56054.3	1783.99	18-0 P27	56151.3	1780.90	14-0 P13			
56060.3	1783.79	14-0 R17	56152.2	1780.87	15-0 P19			
56061.9	1783.74	15-0 P21	56152.5	1780.87	16-0 R23			
56063.0	1783.71	13-0 R 5	56153.8	1780.82	14-0 P13			
56063.8	1783.68	14-0 R17	56154.4	1780.81	17-0 R25			
56064.6	1783.66	13-0 R 5	56154.4	1780.80	15-0 P19			
56067.4	1783.57	15-0 P21	56157.7	1780.70	16-0 R23			
56070.0	1783.48	15-0 P21	56171.5	1780.26	18-0 R25			
56070.1	1783.48	13-0 P 3	56171.7	1780.26	18-0 P25			
56071.3	1783.44	19-0 P27	56176.6	1780.10	14-0 R13			
56071.3	1783.44	13-0 P 3	56179.4	1780.01	15-0 R19			
56071.9	1783.43	13-0 P 3	56179.5	1780.01	14-0 R13			
56077.4	1783.25	13-0 R 3	56180.5	1779.98	14-0 R13			
56078.6	1783.21	18-0 R27	56182.3	1779.92	18-0 P25			
56078.7	1783.21	13-0 R 3	56185.0	1779.84	15-0 R19			
56079.0	1783.20	13-0 R 3	56187.6	1779.75	15-0 R19			

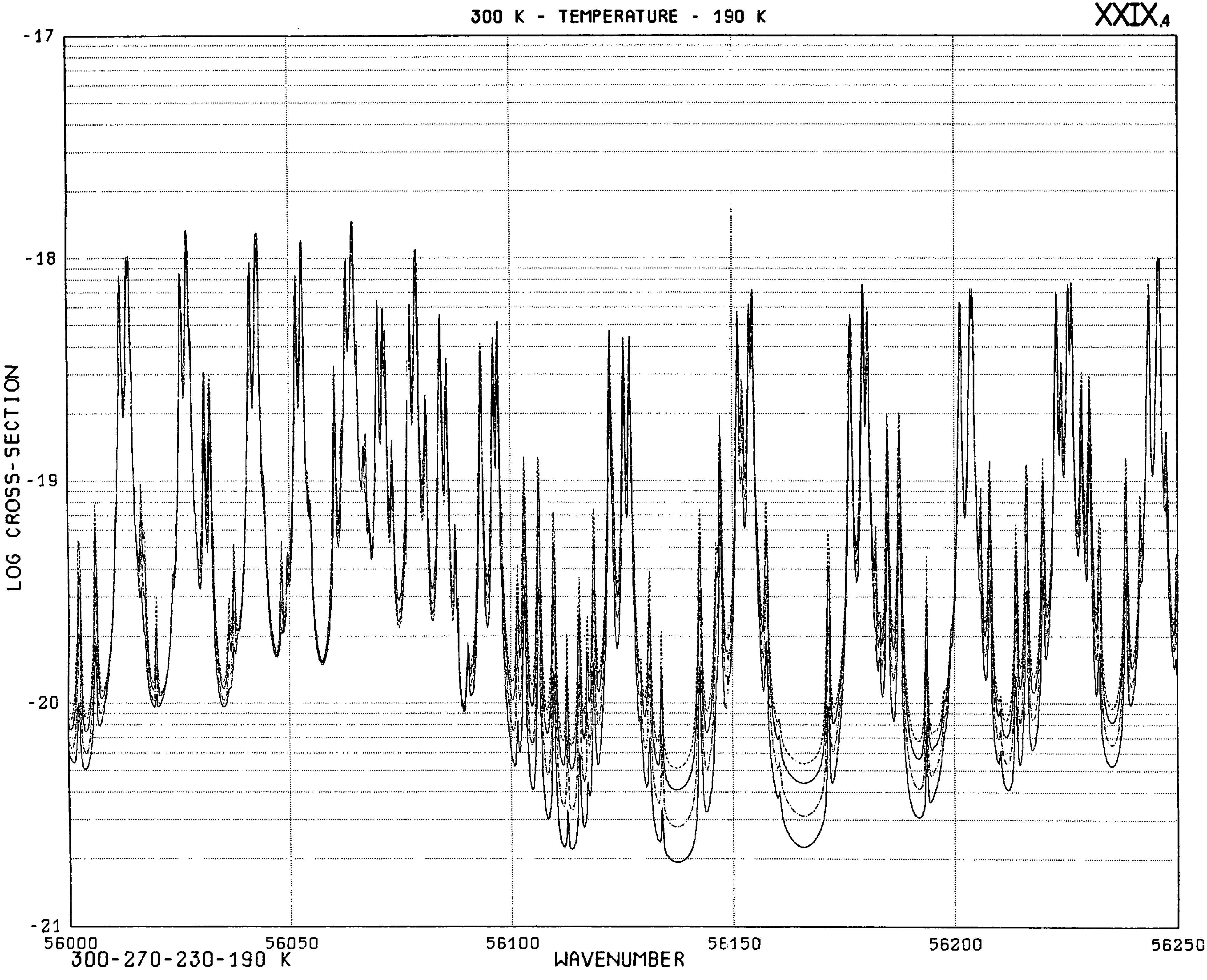
IDENTIFICATION



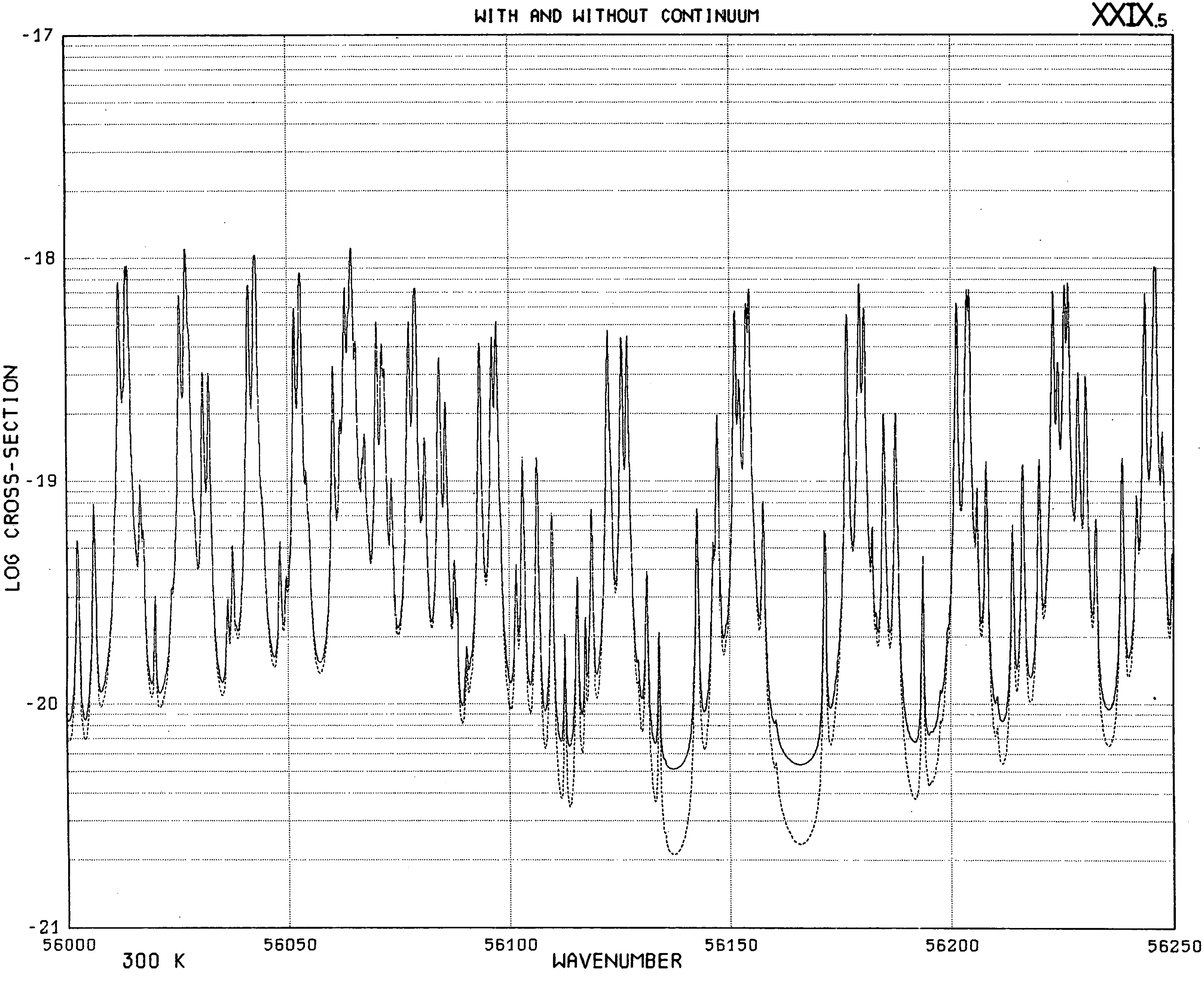

CROSS-SECTION
13-0 BAND FROM R9 TO R1
14-0 BAND FROM P17 TO P9
15-0 BAND FROM R23 TO P17
16-0 BAND FROM P25 TO R21
17-0 BAND FROM P27 TO R23
18-0 BAND FROM P27 TO R25
19-0 BAND FROM P27 TO R25
15-0 BAND O.S.=2.7x10^-5
L.W.=0.5cm^-1
16-0 BAND O.S.=2.6x10^-5
L.W.=0.5cm^-1
LOG SIGMA(O2)
-17
-18
-19
-20
-21
56000
56050
56100
56150
56200
56250
300 K
WAVENUMBER

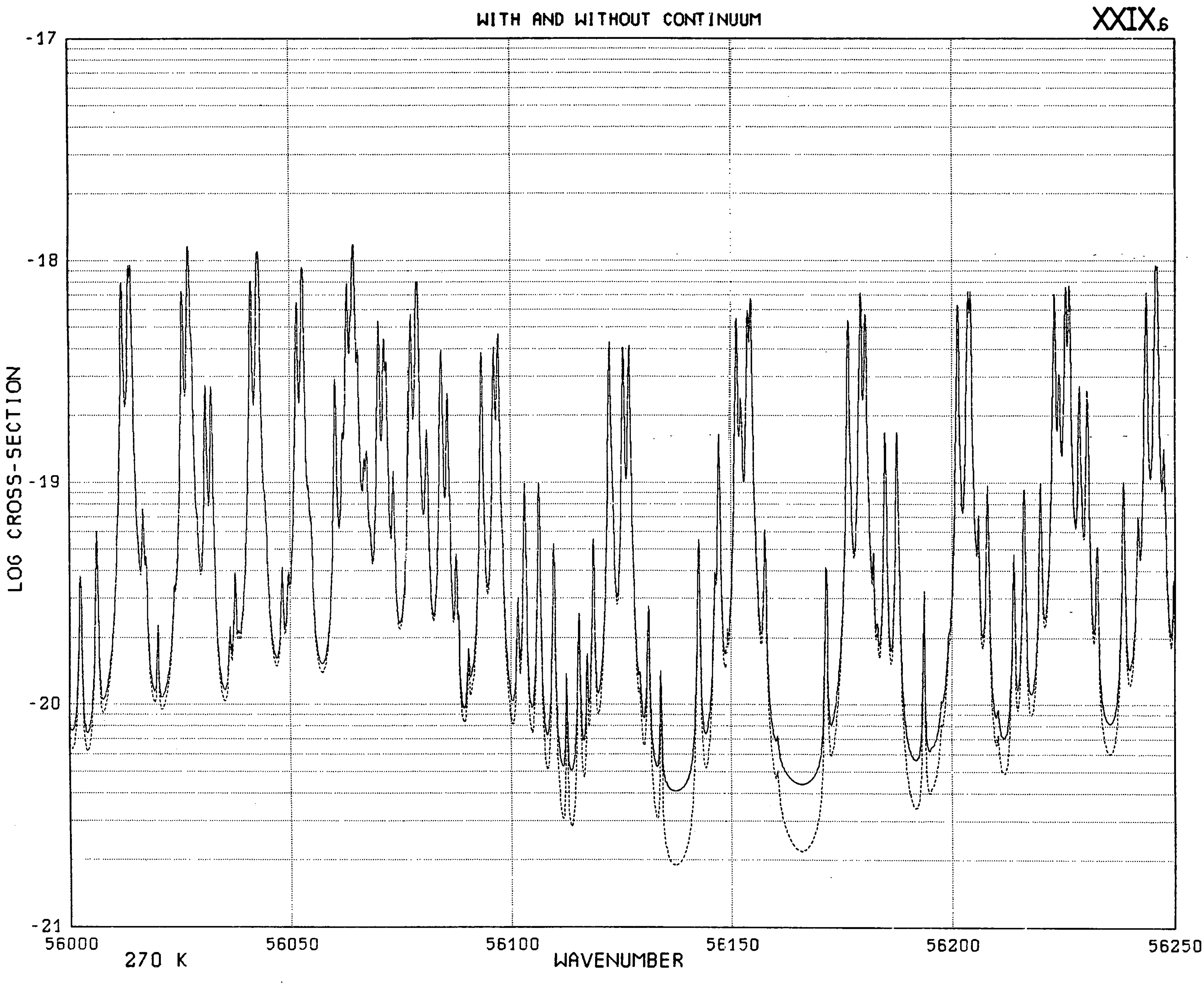

CONTINUUM-VARIATION 10% AND 20%
LOG CROSS-SECTION
-17
-18
-19
-20
-21
56000
56050
56100
56150
56200
56250
300 K
WAVENUMBER

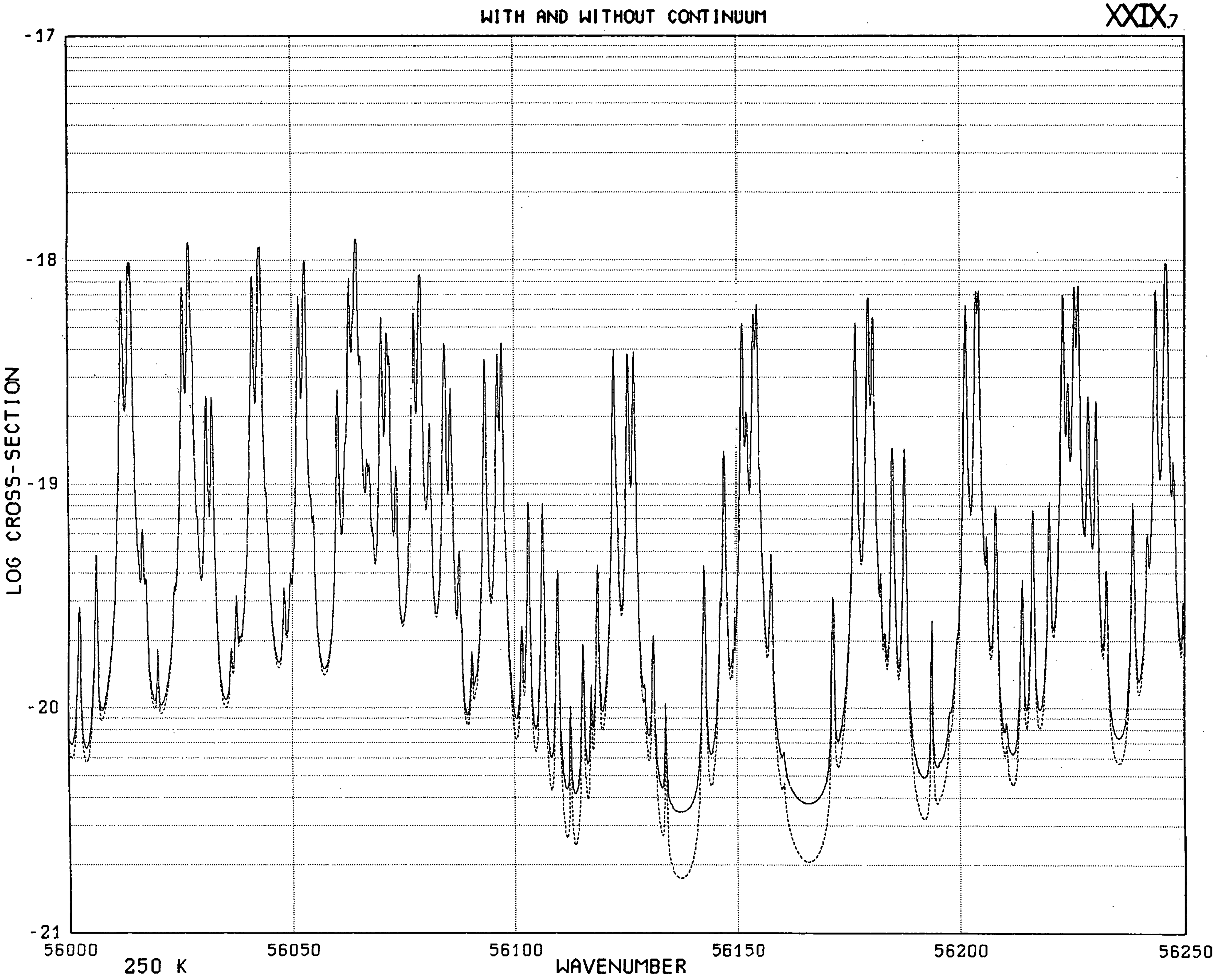
XXIX.4



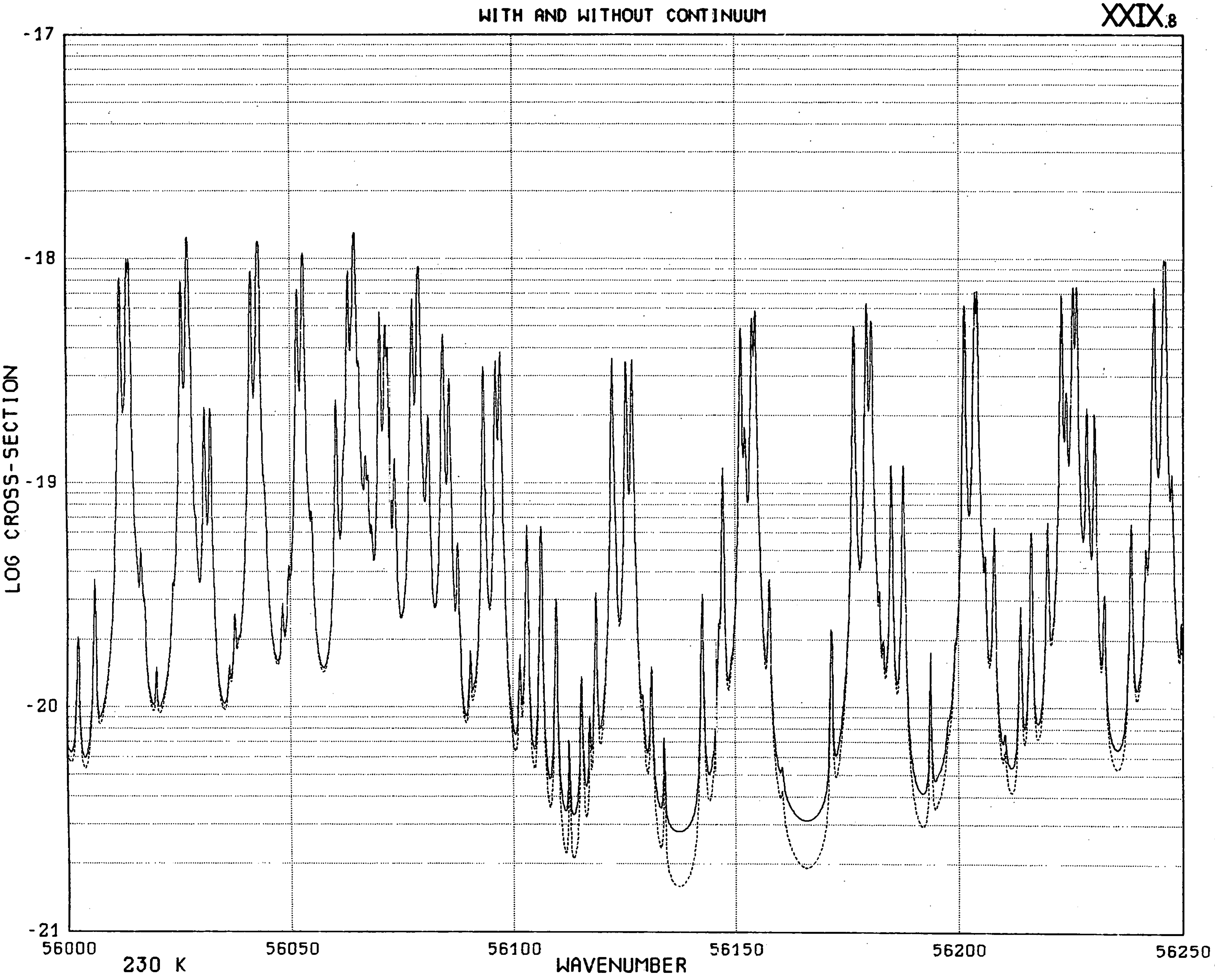
300 K - TEMPERATURE - 190 K
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56000
56050
56100
56150
56200
56250
300-270-230-190 K
WAVENUMBER

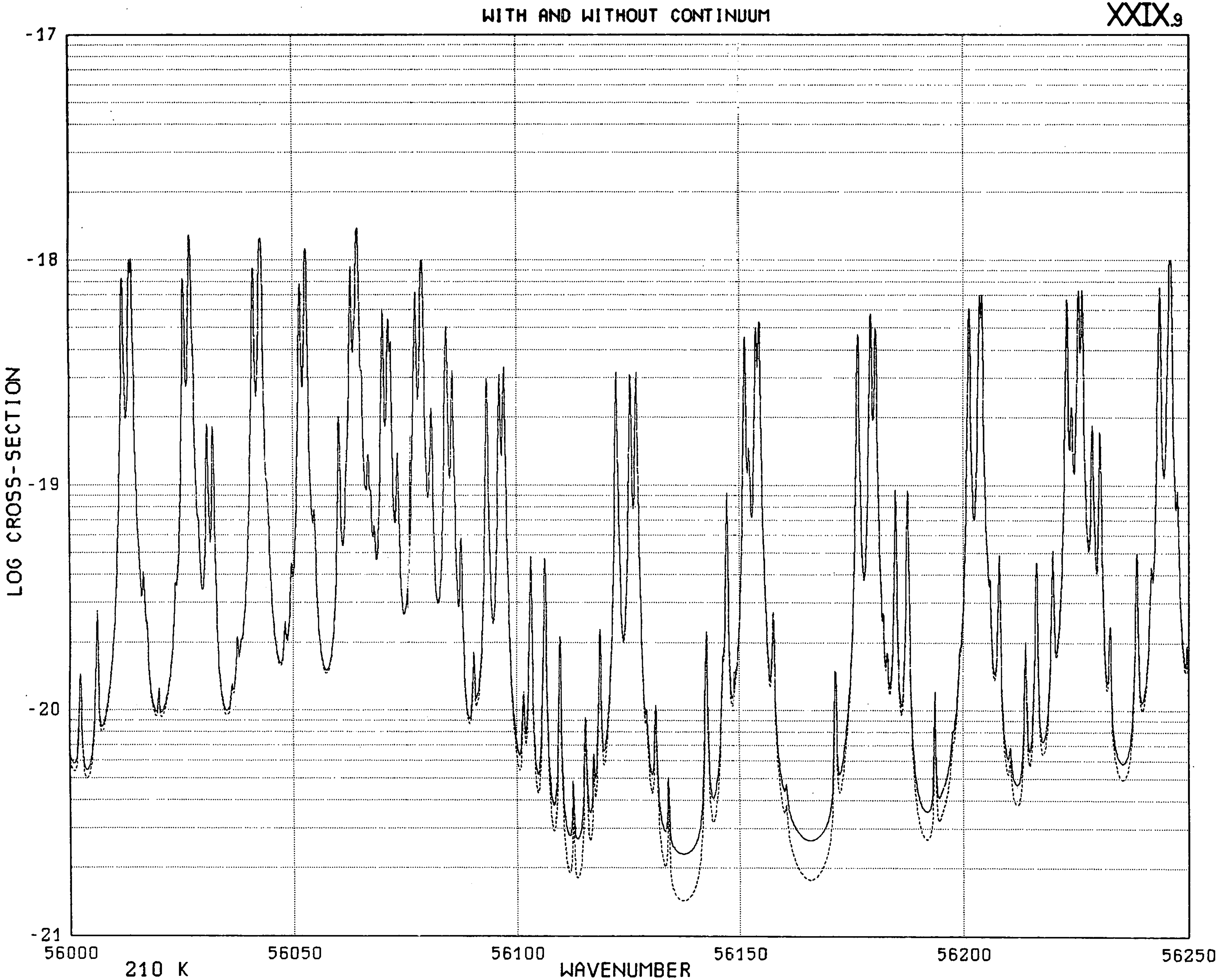

WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56000
56050
56100
56150
56200
56250
300 K
WAVENUMBER

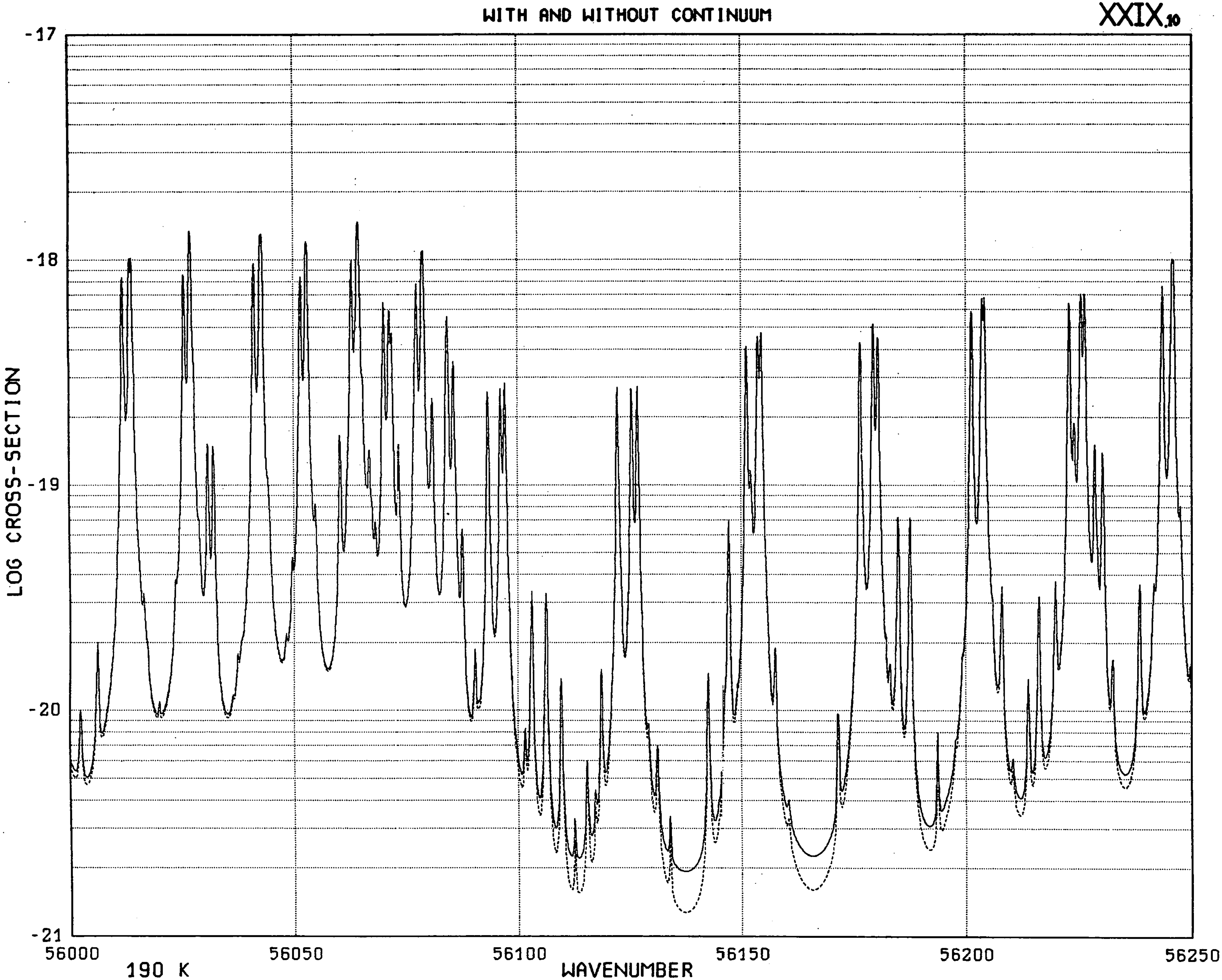

WITH AND WITHOUT CONTINUUM
XXIX.6
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56000
56050
56100
56150
56200
56250
270 K
WAVENUMBER



WITH AND WITHOUT CONTINUUM
XXIX.7
LOG CROSS-SECTION
-17
-18
-19
-20
-21
56000
56050
56100
56150
56200
56250
250 K
WAVENUMBER

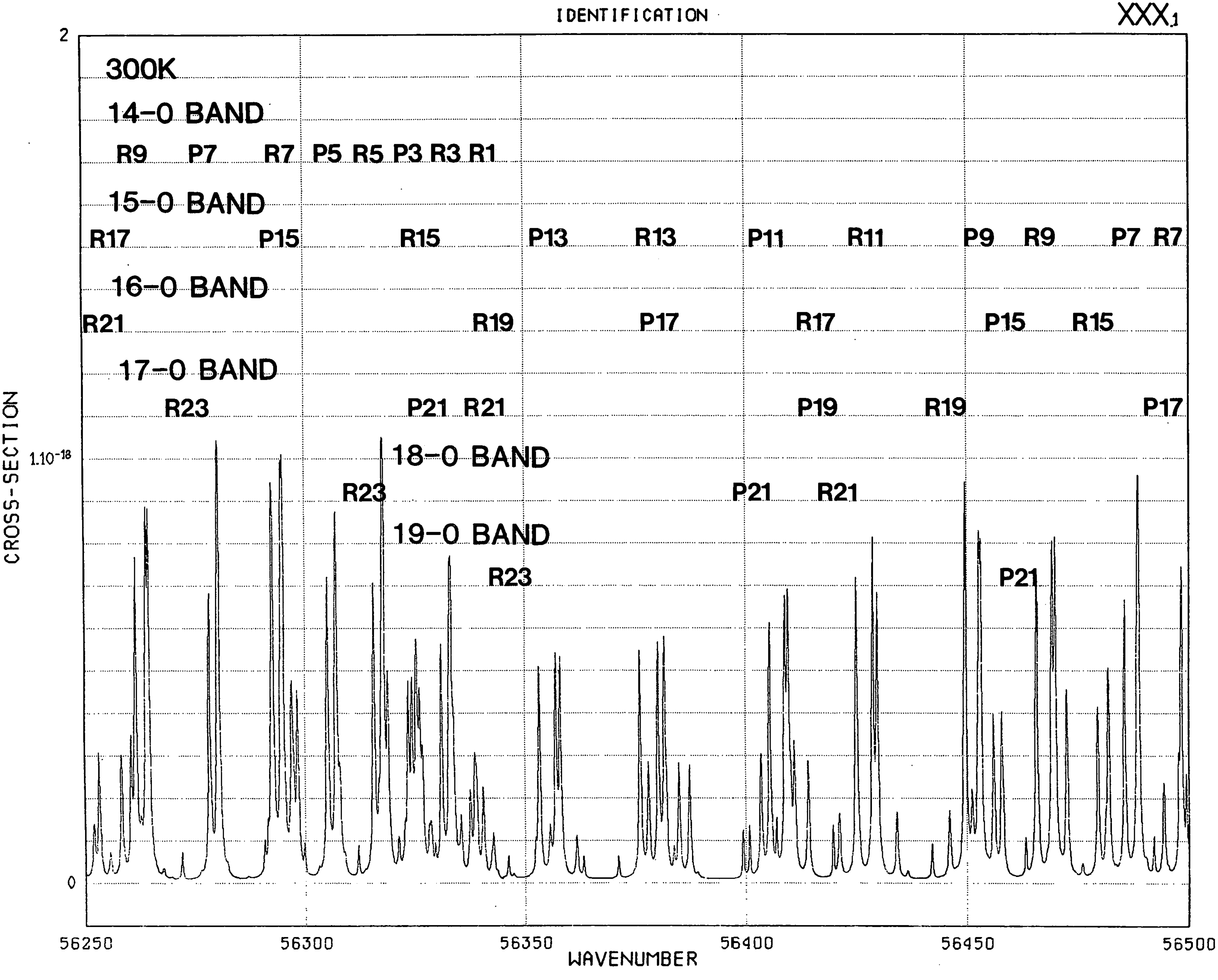

WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-17
-18
-19
-20
-21
56000
56050
56100
56150
56200
56250
230 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
XXIX.9
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56000
56050
56100
56150
56200
56250
210 K
WAVENUMBER

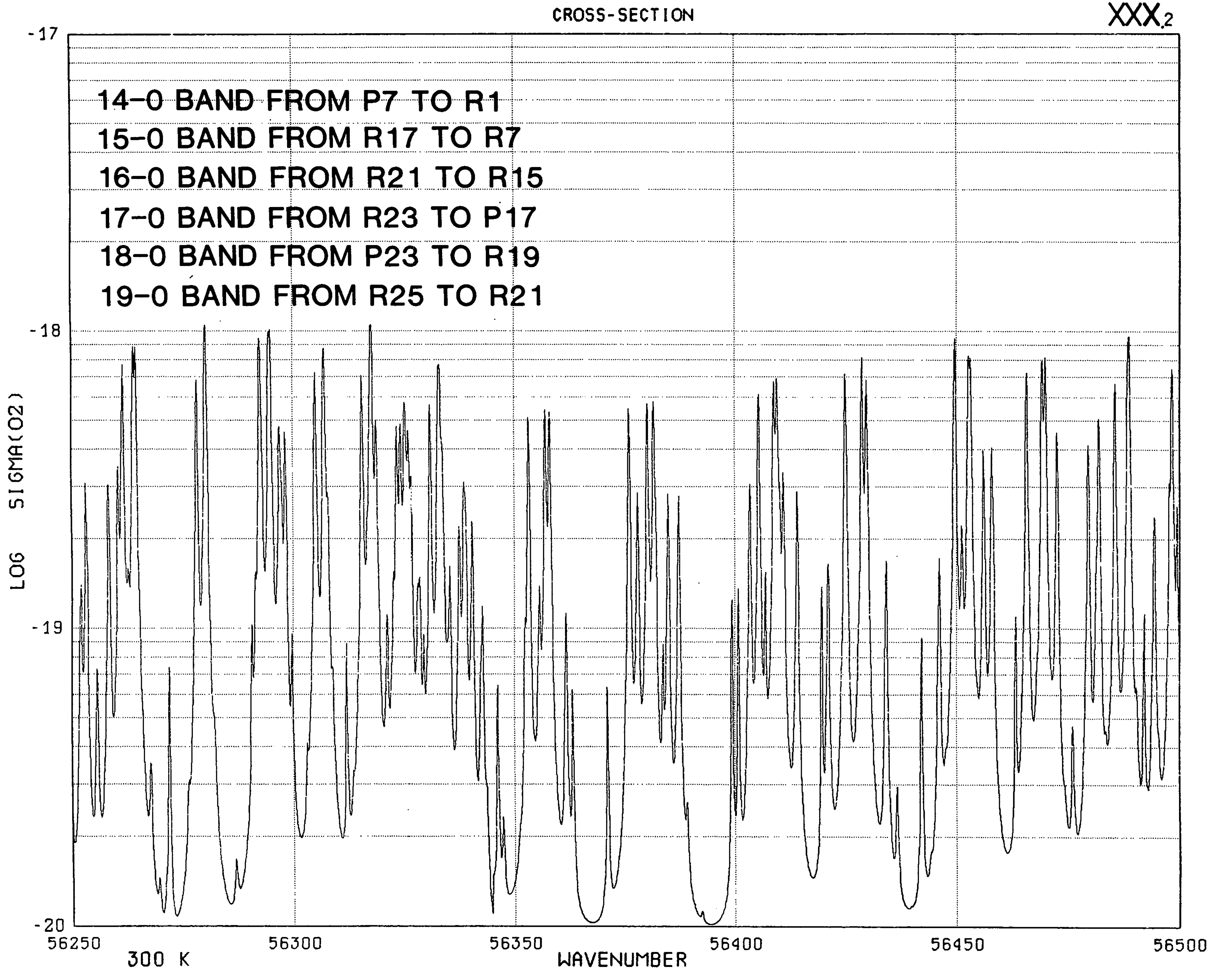

WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56000
56050
56100
56150
56200
56250
190 K
WAVENUMBER

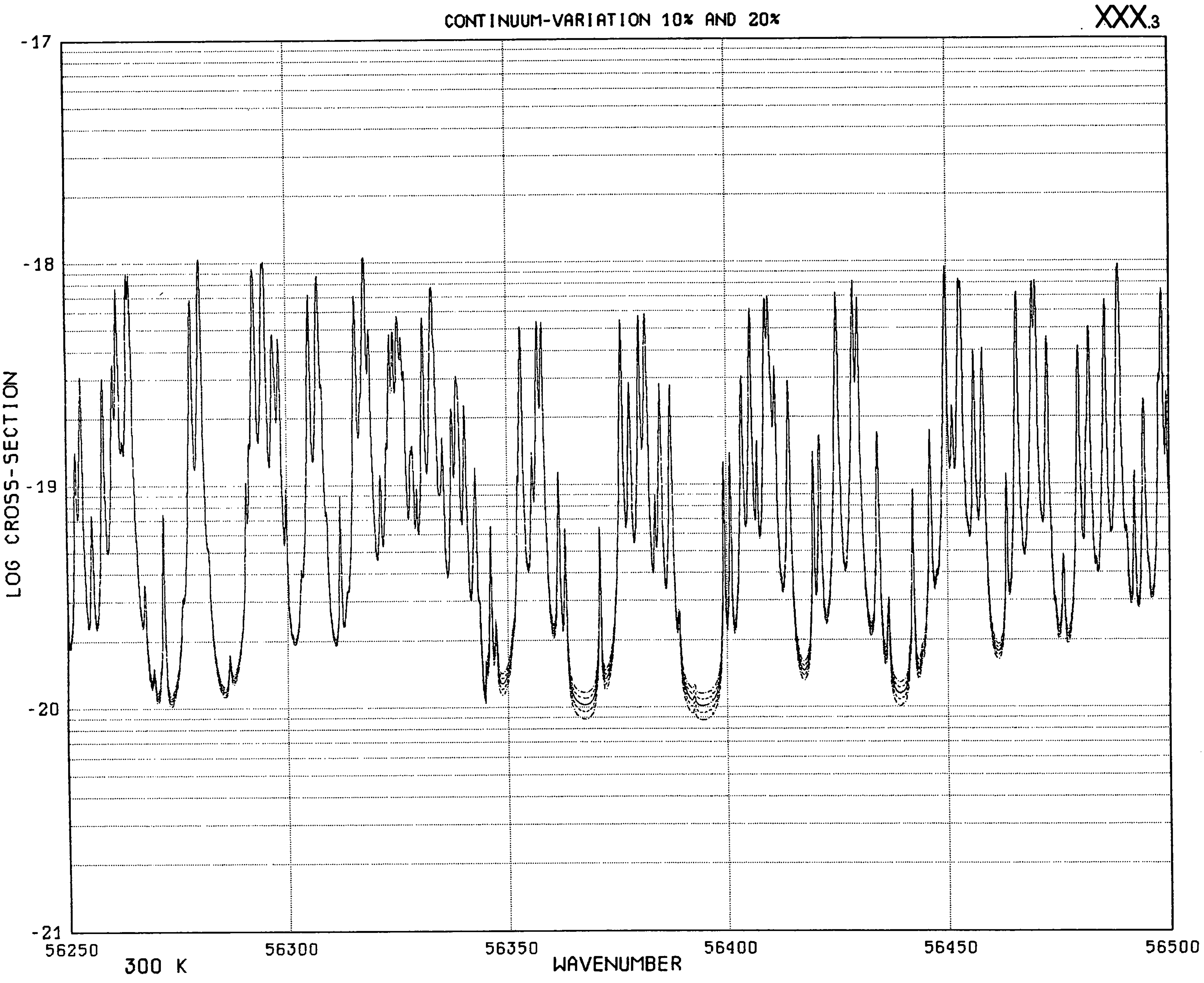
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
56250 - 56500 cm^{-1}

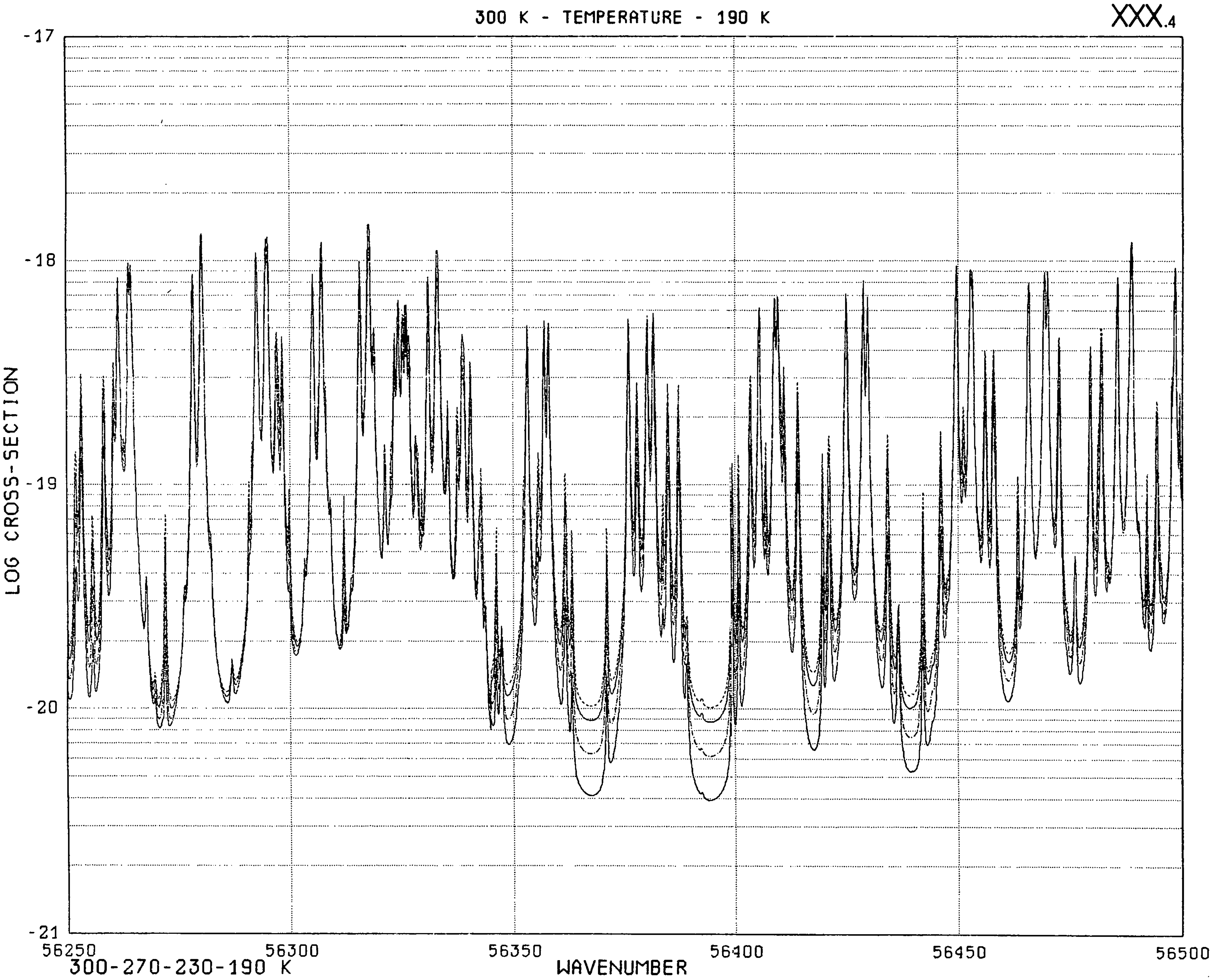
ν	λ	band	ν	λ	band	ν	λ	band
56250								
56252.1	1777.71	16-0 R21	56333.6	1775.14	17-0 P21	56446.1	1771.60	17-0 R19
56253.3	1777.67	15-0 R17	56333.8	1775.13	16-0 R19	56449.6	1771.49	15-0 P 9
56255.7	1777.60	17-0 R23	56335.4	1775.08	14-0 P 1	56450		
56258.4	1777.51	15-0 R17	56337.5	1775.02	16-0 R19	56451.2	1771.44	17-0 R19
56260.6	1777.44	15-0 R17	56338.6	1774.98	14-0 R 1	56452.8	1771.39	15-0 P 9
56261.6	1777.41	14-0 R 9	56339.0	1774.97	14-0 Q 1	56453.2	1771.38	15-0 P 9
56262.8	1777.37	17-0 R23	56340.4	1774.92	14-0 R 1	56456.1	1771.29	16-0 P15
56264.0	1777.34	14-0 R 9	56342.8	1774.85	17-0 R21	56458.0	1771.23	16-0 P15
56264.4	1777.32	19-0 R25	56346.2	1774.74	19-0 R23	56458.3	1771.22	19-0 R21
56271.9	1777.09	18-0 P23	56350			56463.3	1771.06	19-0 P21
56278.3	1776.88	14-0 P 7	56352.4	1774.55	19-0 P23	56465.8	1770.98	15-0 R 9
56280.2	1776.82	14-0 P 7	56353.2	1774.52	15-0 P13	56469.3	1770.88	15-0 R 9
56280.5	1776.82	14-0 P 7	56355.7	1774.45	17-0 R21	56470.0	1770.85	15-0 R 9
56290.7	1776.49	18-0 P23	56357.0	1774.40	15-0 P13	56472.4	1770.78	19-0 P21
56291.5	1776.47	18-0 R23	56358.0	1774.37	15-0 P13	56472.6	1770.77	16-0 R15
56292.5	1776.44	14-0 R 7	56361.7	1774.26	17-0 R21	56479.6	1770.55	16-0 R15
56292.8	1776.43	15-0 P15	56363.1	1774.21	19-0 P23	56481.3	1770.50	19-0 R21
56294.6	1776.37	14-0 R 7	56371.0	1773.96	19-0 R23	56481.8	1770.48	18-0 P19
56295.0	1776.36	14-0 R 7	56376.0	1773.80	15-0 R13	56482.0	1770.47	16-0 R15
56297.0	1776.29	15-0 P15	56378.0	1773.74	16-0 P17	56485.6	1770.36	15-0 P 7
56297.4	1776.28	16-0 P19	56380.2	1773.67	15-0 R13	56488.5	1770.27	15-0 P 7
56298.3	1776.25	15-0 P15	56381.6	1773.63	15-0 R13	56488.8	1770.26	15-0 P 7
56299.8	1776.21	18-0 P23	56382.0	1773.61	18-0 P21	56492.2	1770.16	19-0 R21
56300			56383.7	1773.56	19-0 R23	56494.4	1770.09	17-0 P17
56305.0	1776.04	16-0 P19	56384.9	1773.52	16-0 P17	56497.8	1769.98	18-0 P19
56305.1	1776.04	14-0 P 5	56387.3	1773.45	16-0 P17	56498.4	1769.96	15-0 R 7
56307.0	1775.98	14-0 P 5	56399.4	1773.07	18-0 P21	56499.5	1769.93	18-0 R19
56307.2	1775.97	14-0 P 5	56400					
56312.0	1775.82	18-0 R23	56400.8	1773.02	18-0 R21			
56315.6	1775.71	14-0 R 5	56403.5	1772.94	16-0 R17			
56316.8	1775.67	17-0 P21	56405.5	1772.88	15-0 P11			
56317.5	1775.65	14-0 R 5	56407.0	1772.83	18-0 P21			
56317.9	1775.64	14-0 R 5	56408.9	1772.77	15-0 P11			
56318.8	1775.61	15-0 R15	56409.6	1772.75	15-0 P11			
56322.7	1775.48	18-0 R23	56410.2	1772.73	17-0 P19			
56323.4	1775.46	15-0 R15	56411.1	1772.70	16-0 R17			
56324.3	1775.43	14-0 P 3	56414.1	1772.60	16-0 R17			
56325.2	1775.40	15-0 R15	56419.7	1772.43	18-0 R21			
56325.5	1775.40	16-0 R19	56421.2	1772.38	17-0 P19			
56326.1	1775.38	14-0 P 3	56425.0	1772.26	15-0 R11			
56326.7	1775.36	14-0 P 3	56425.3	1772.25	17-0 P19			
56328.6	1775.30	17-0 P21	56428.8	1772.15	18-0 R21			
56329.5	1775.27	19-0 P23	56428.8	1772.14	15-0 R11			
56331.0	1775.22	14-0 R 3	56429.9	1772.11	15-0 R11			
56332.8	1775.16	14-0 R 3	56434.2	1771.97	17-0 R19			
56333.2	1775.15	14-0 R 3	56442.1	1771.73	19-0 P21			


IDENTIFICATION
300K
14–0 BAND
R9 P7 R7 P5 R5 P3 R3 R1
15–0 BAND
R17 P15 R15 P13 R13 P11 R11 P9 R9 P7 R7
16–0 BAND
R21 R19 P17 R17 P15 R15
17–0 BAND
R23 P21 R21 P19 R19 P17
18–0 BAND
R23 P21 R21
19–0 BAND
R23 P21
CROSS-SECTION
2
1.10^{-18}
0
56250
56300
56350
56400
56450
56500
WAVENUMBER

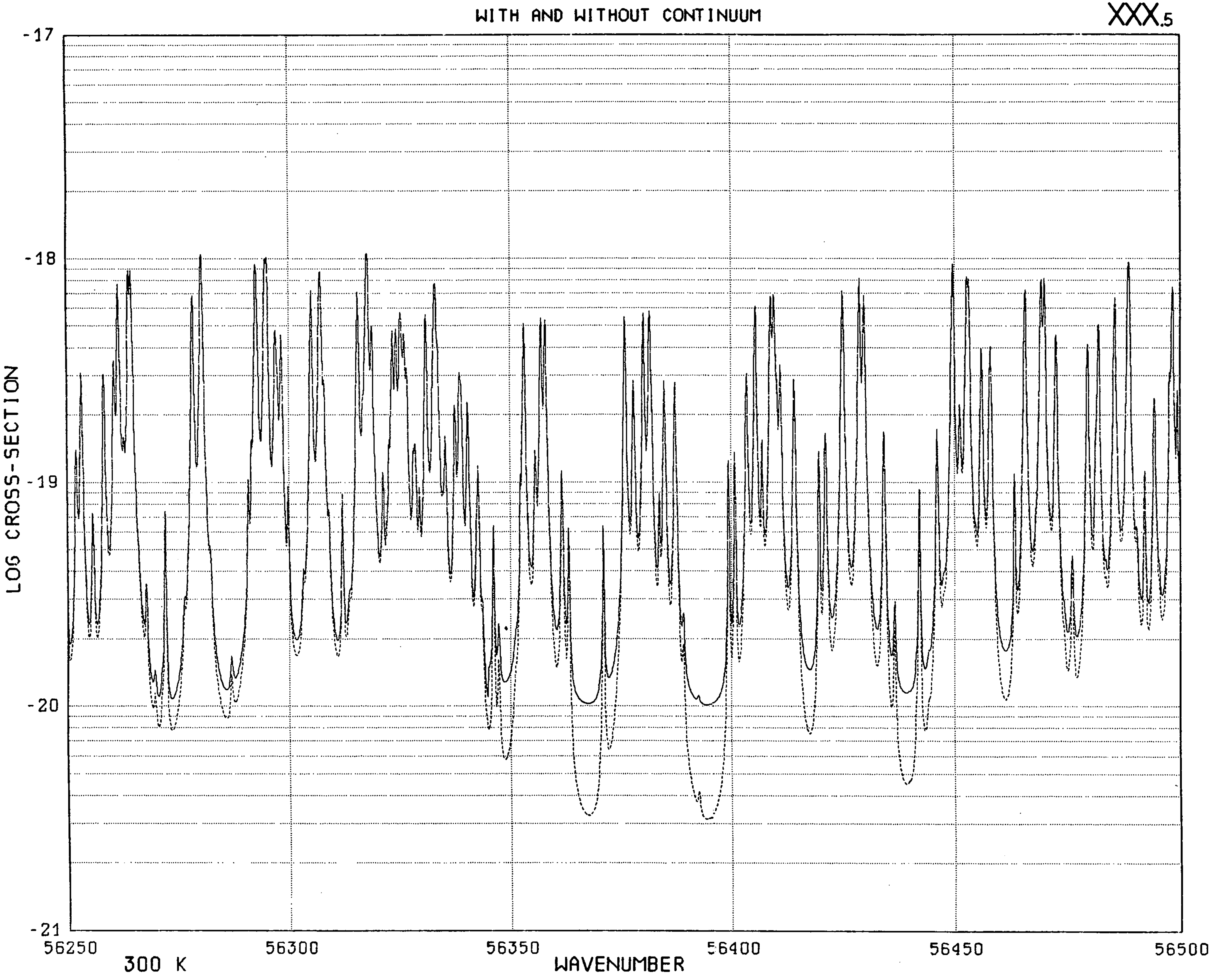
XXX.2

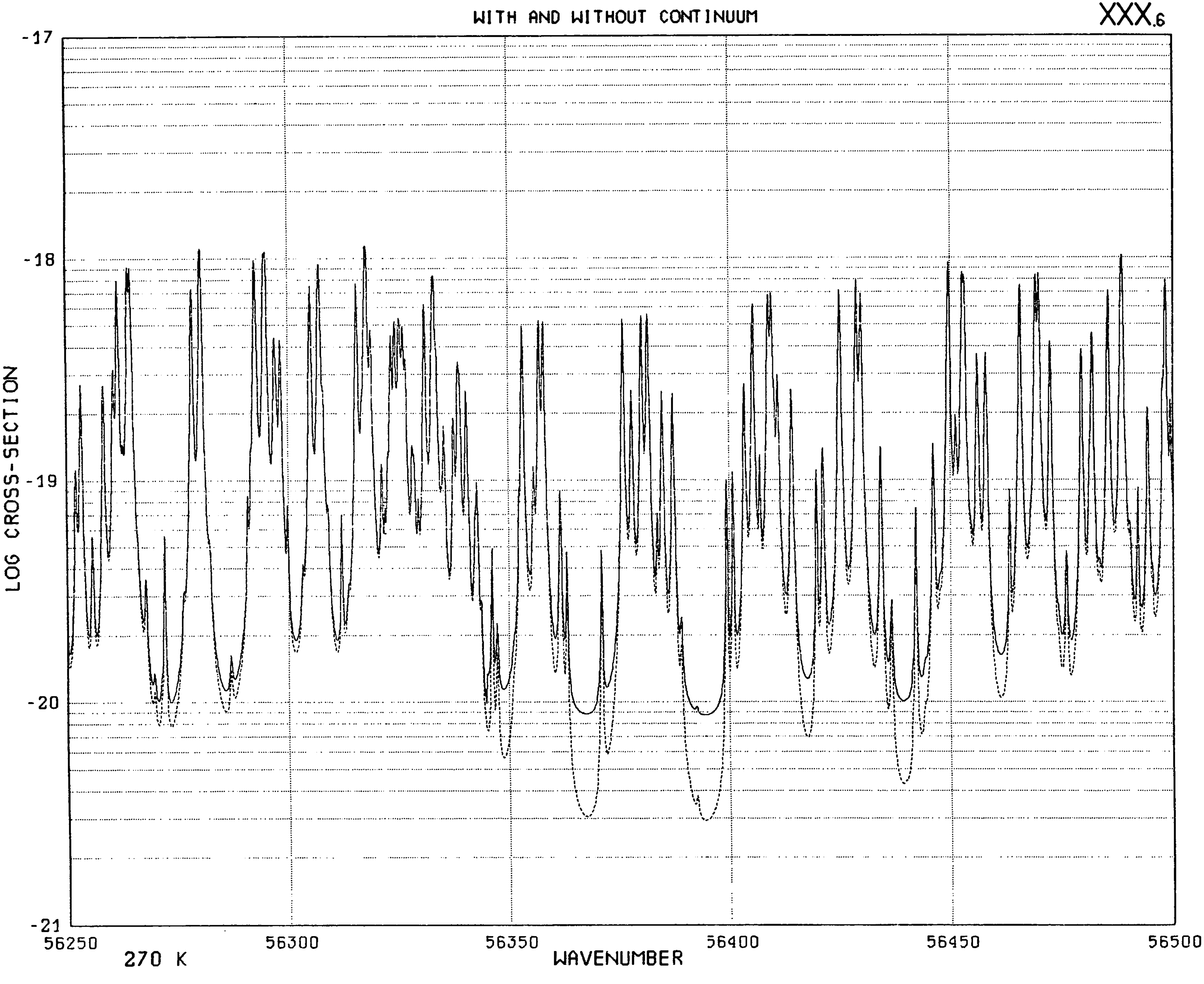

CROSS-SECTION
14-0 BAND FROM P7 TO R1
15-0 BAND FROM R17 TO R7
16-0 BAND FROM R21 TO R15
17-0 BAND FROM R23 TO P17
18-0 BAND FROM P23 TO R19
19-0 BAND FROM R25 TO R21
-17
-18
-19
-20
LOG SIGMA(O2)
56250
56300
56350
56400
56450
56500
300 K
WAVENUMBER

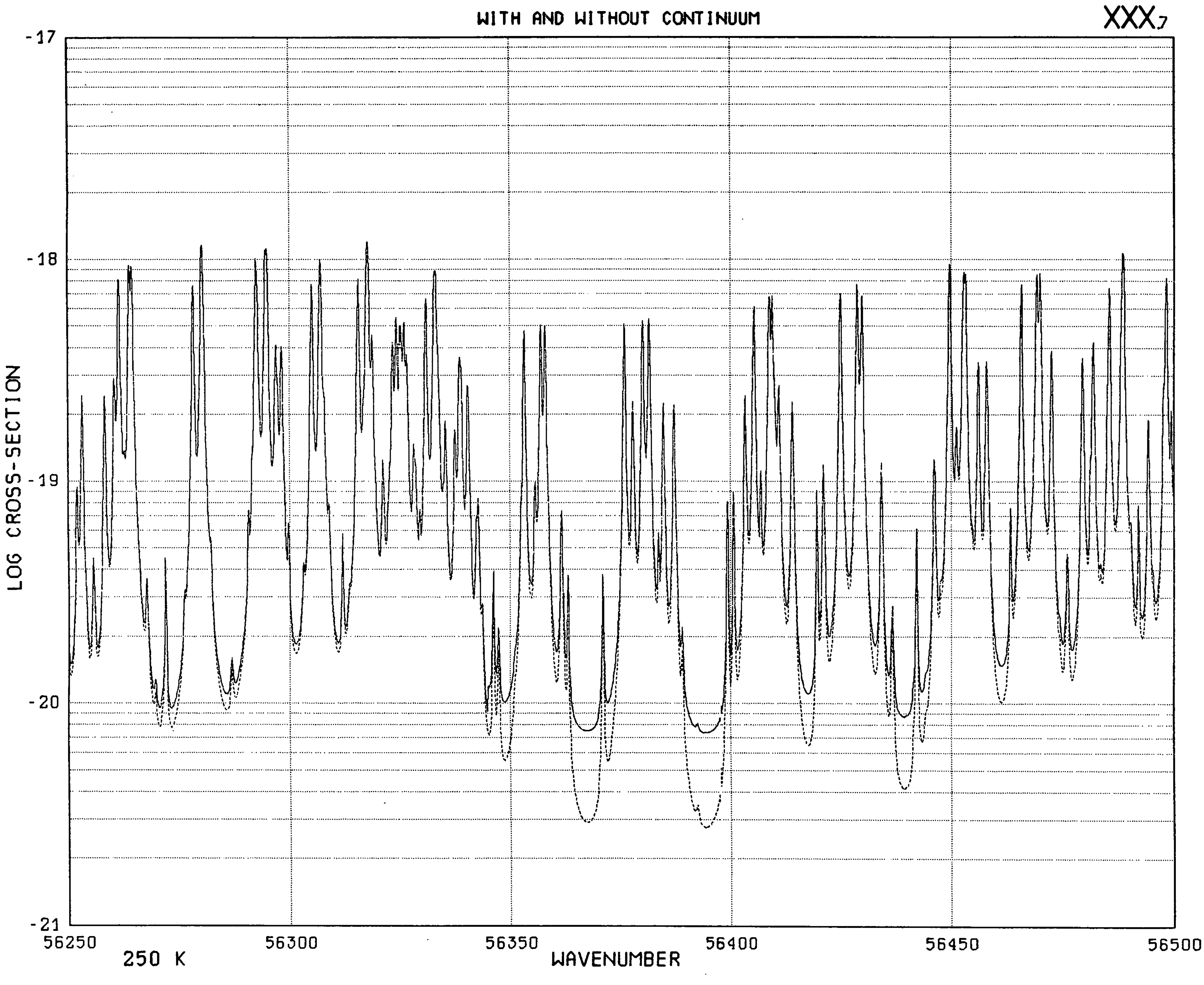

CONTINUUM-VARIATION 10% AND 20%
XXX.3
LOG CROSS-SECTION
-17
-18
-19
-20
-21
56250
56300
56350
56400
56450
56500
300 K
WAVENUMBER

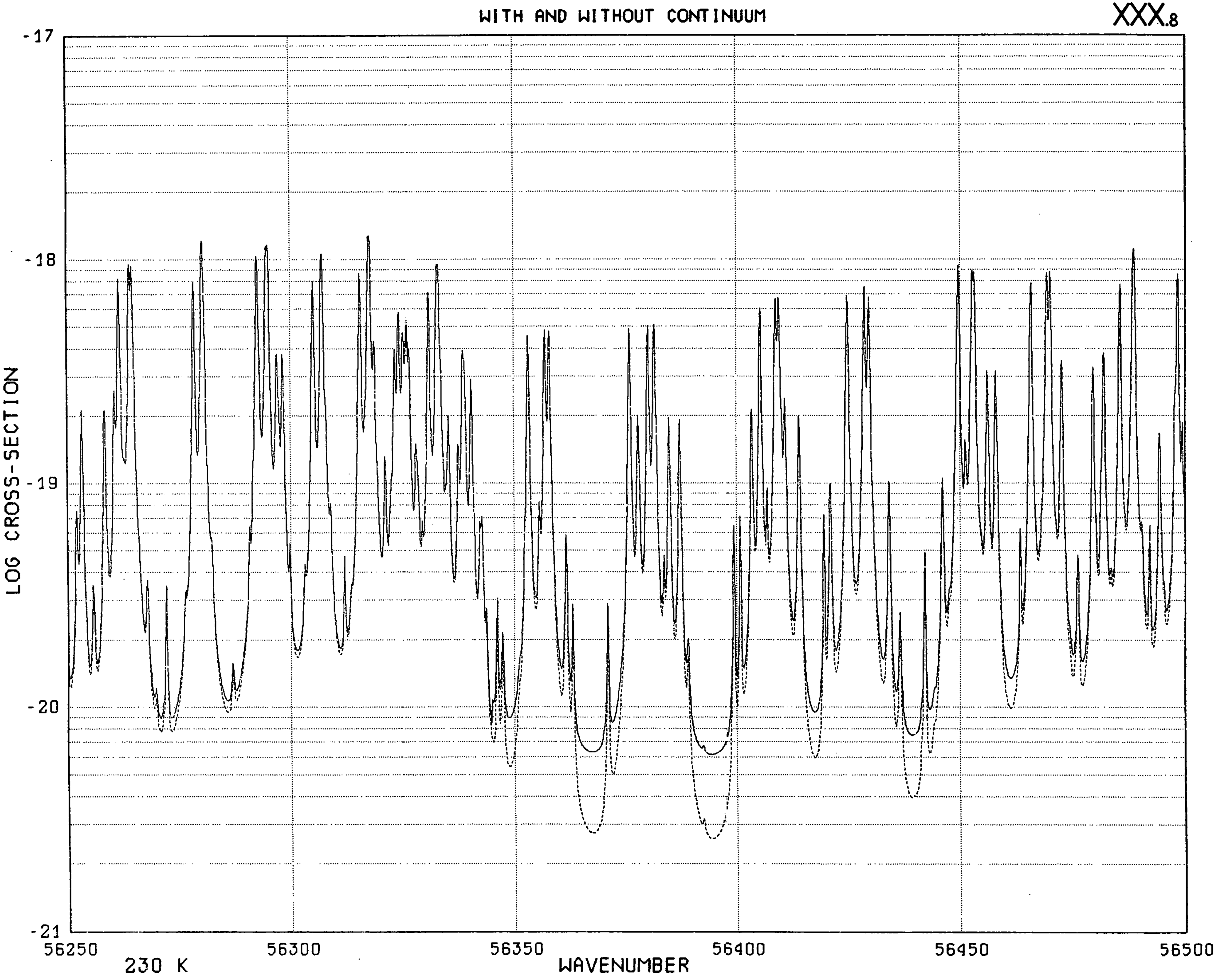


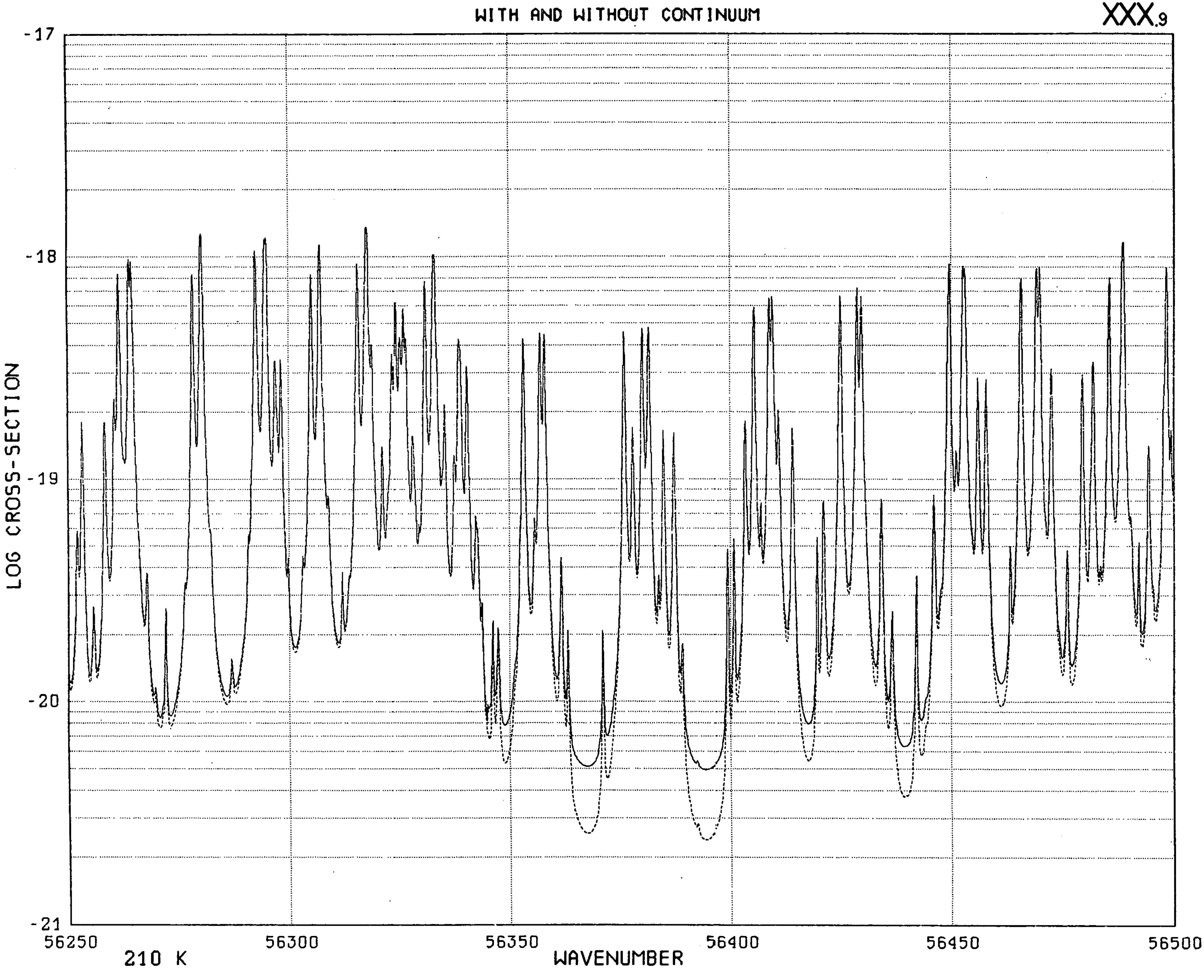
XXX.4
300 K - TEMPERATURE - 190 K
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56250
56300
56350
56400
56450
56500
300-270-230-190 K
WAVENUMBER

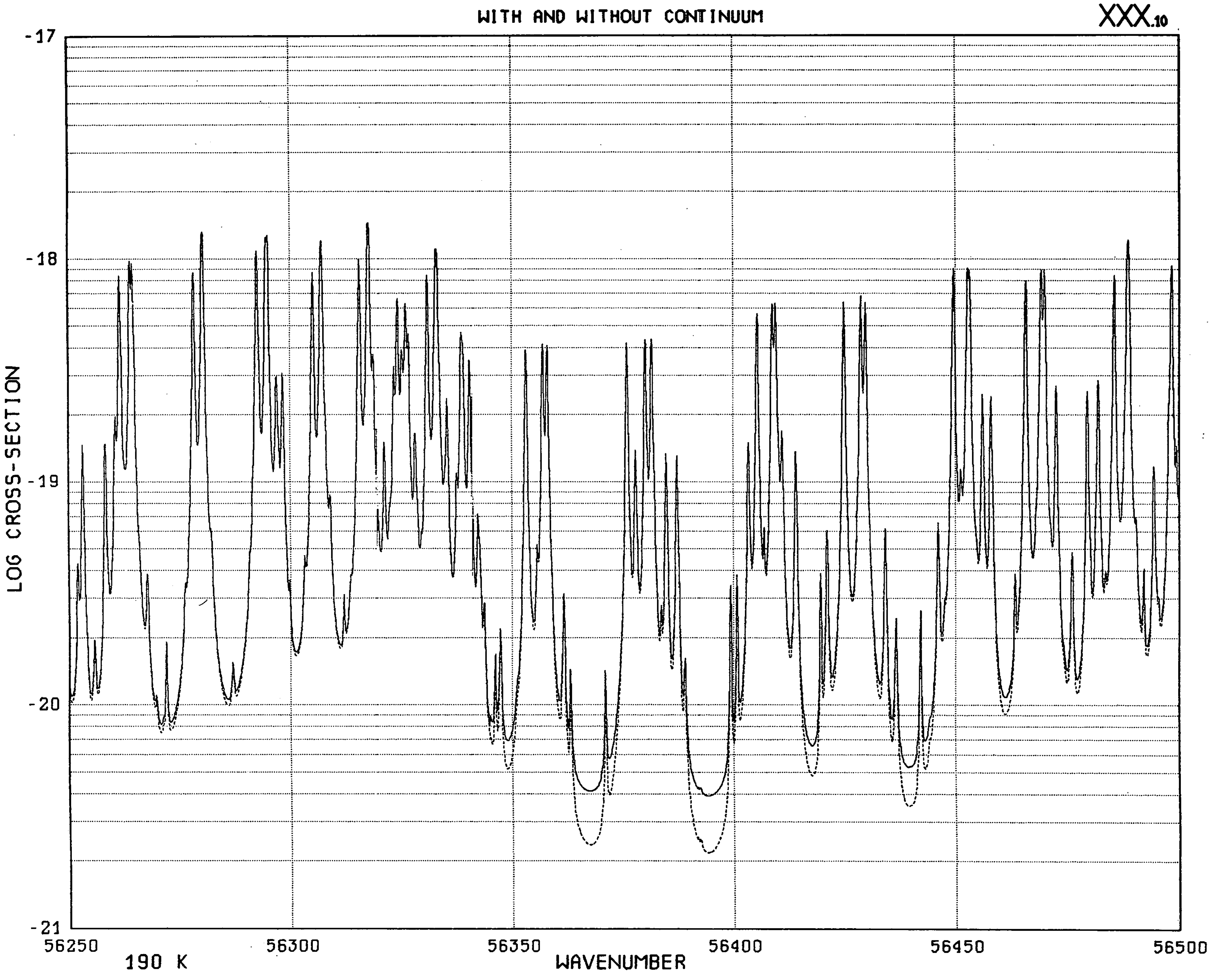

WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56250
56300
56350
56400
56450
56500
300 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-17
-18
-19
-20
-21
56250
56300
56350
56400
56450
56500
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
XXX7
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56250
56300
56350
56400
56450
56500
250 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56250
56300
56350
56400
56450
56500
230 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56250
56300
56350
56400
56450
56500
210 K
WAVENUMBER



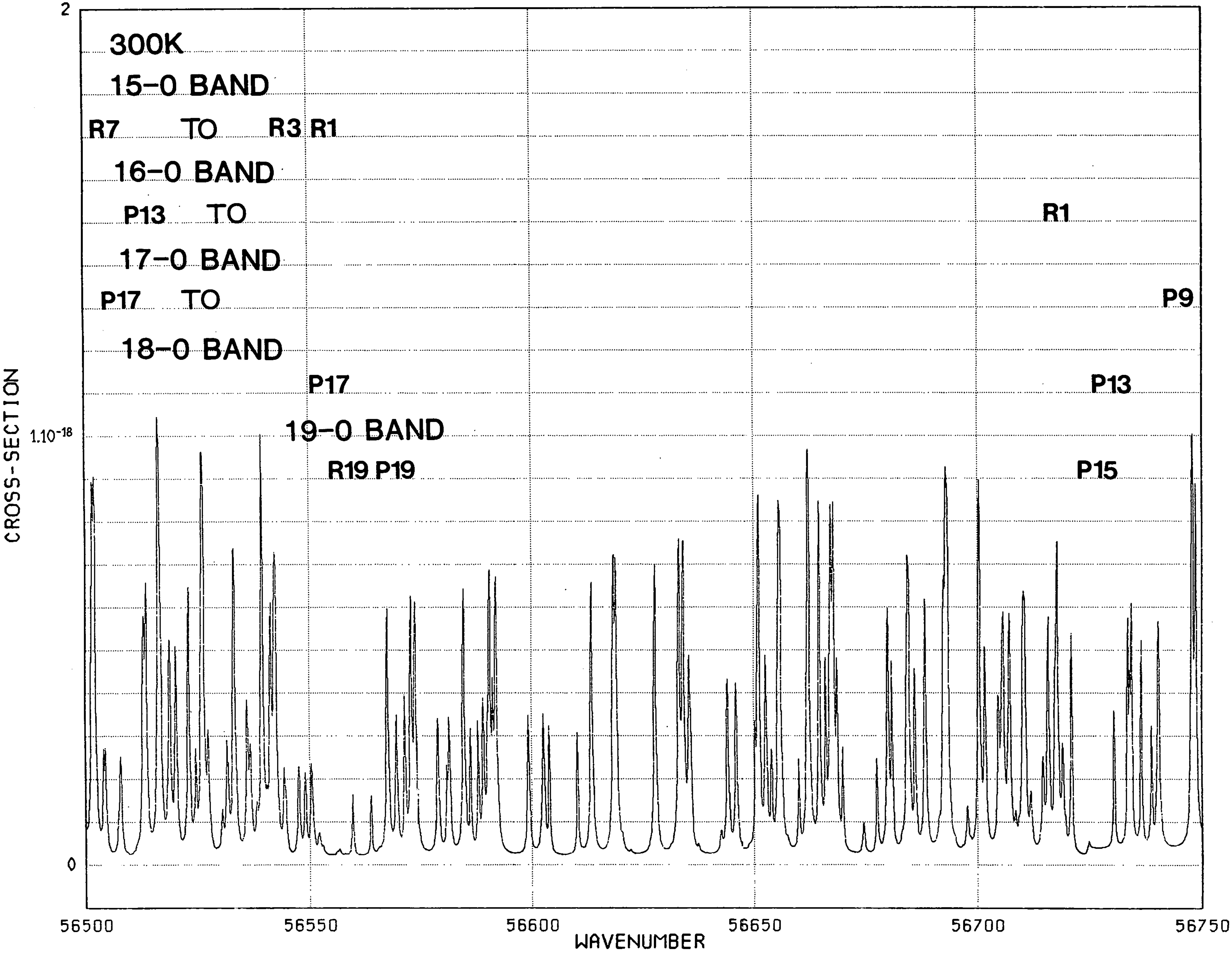
WITH AND WITHOUT CONTINUUM
XXX.10
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56250
56300
56350
56400
56450
56500
190 K
WAVENUMBER

IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES
56500 - 56750 cm^{-1}

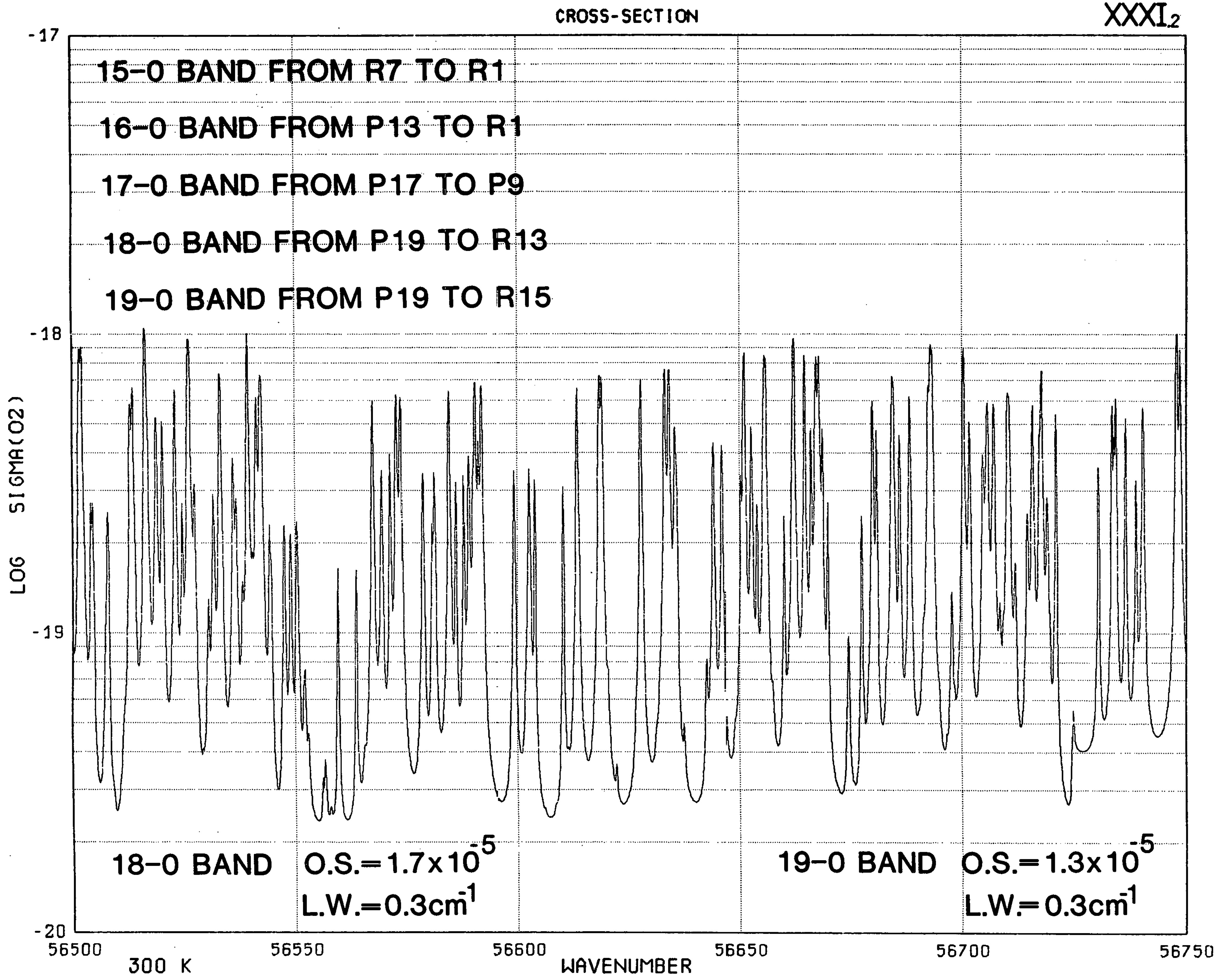
v	λ	band
56500		
56501.6	1769.86	15-0 R 7
56502.1	1769.85	15-0 R 7
56504.1	1769.78	18-0 P19
56504.5	1769.77	17-0 P17
56507.9	1769.66	17-0 P17
56512.9	1769.51	16-0 P13
56513.5	1769.49	15-0 P 5
56516.3	1769.40	15-0 P 5
56516.3	1769.40	17-0 R17
56516.5	1769.39	15-0 P 5
56516.9	1769.38	18-0 R19
56518.8	1769.32	16-0 P13
56520.1	1769.28	16-0 P13
56522.9	1769.19	15-0 R 5
56524.6	1769.14	18-0 R19
56525.9	1769.10	15-0 R 5
56526.2	1769.09	15-0 R 5
56527.3	1769.06	17-0 R17
56531.5	1768.93	17-0 R17
56533.0	1768.88	16-0 R13
56533.3	1768.87	15-0 P 3
56536.0	1768.78	15-0 P 3
56536.7	1768.76	15-0 P 3
56539.3	1768.68	15-0 R 3
56539.4	1768.68	16-0 R13
56541.3	1768.62	16-0 R13
56542.1	1768.59	15-0 R 3
56542.5	1768.58	15-0 R 3
56544.2	1768.53	19-0 P19
56547.5	1768.42	15-0 R 1
56549.0	1768.38	15-0 Q 1
56550		
56550.4	1768.34	15-0 R 1
56559.6	1768.05	19-0 R19
56563.8	1767.92	19-0 P19
56567.5	1767.80	16-0 P11
56569.5	1767.74	17-0 P15
56571.3	1767.68	19-0 P19
56571.5	1767.67	18-0 P17
56572.8	1767.63	16-0 P11
56573.8	1767.60	16-0 P11
56578.8	1767.45	17-0 P15
56580.9	1767.38	19-0 R19
56581.4	1767.36	17-0 P15
56584.7	1767.26	16-0 R11
56586.2	1767.22	18-0 P17

v	λ	band
56587.9	1767.16	18-0 R17
56589.1	1767.13	17-0 R15
56590.0	1767.10	19-0 R19
56590.5	1767.08	16-0 R11
56591.3	1767.06	18-0 P17
56592.0	1767.04	16-0 R11
56599.3	1766.81	17-0 R15
56600		
56602.6	1766.70	17-0 R15
56603.9	1766.66	18-0 R17
56610.3	1766.46	18-0 R17
56613.5	1766.36	16-0 P 9
56618.4	1766.21	16-0 P 9
56619.0	1766.19	16-0 P 9
56627.8	1765.92	16-0 R 9
56633.2	1765.75	16-0 R 9
56634.1	1765.72	16-0 R 9
56635.5	1765.68	17-0 P13
56644.1	1765.41	17-0 P13
56646.0	1765.35	17-0 P13
56650		
56650.3	1765.22	19-0 R17
56651.0	1765.19	16-0 P 7
56652.7	1765.14	17-0 R13
56653.9	1765.10	19-0 P17
56656.0	1765.04	16-0 P 7
56660.1	1764.91	19-0 P17
56662.1	1764.85	17-0 R13
56662.3	1764.84	16-0 R 7
56664.7	1764.77	18-0 P15
56664.7	1764.77	17-0 R13
56666.2	1764.72	18-0 R15
56667.3	1764.69	16-0 R 7
56667.9	1764.67	16-0 R 7
56668.7	1764.64	18-0 P15
56669.9	1764.60	19-0 R17
56677.5	1764.37	19-0 R17
56680.0	1764.29	16-0 P 5
56680.9	1764.26	18-0 R15
56684.4	1764.15	16-0 P 5
56684.7	1764.15	16-0 P 5
56686.0	1764.10	18-0 R15
56688.3	1764.03	16-0 R 5
56692.4	1763.90	17-0 P11
56693.0	1763.89	16-0 R 5
56693.4	1763.88	16-0 R 5

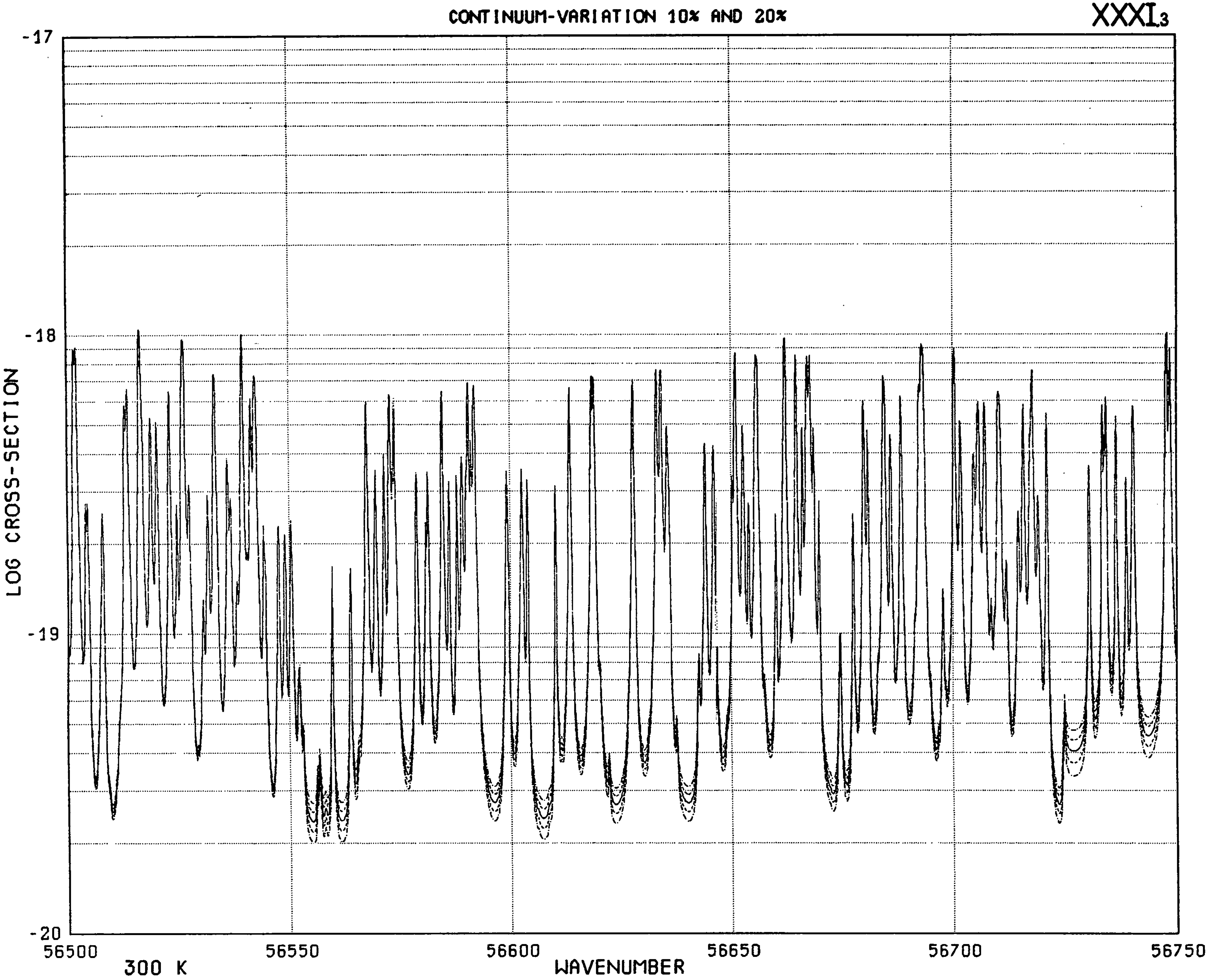
v	λ	band
56700		
56700.4	1763.66	16-0 P 3
56700.4	1763.66	17-0 P11
56701.8	1763.61	17-0 P11
56704.7	1763.52	16-0 P 3
56705.5	1763.50	16-0 P 3
56705.8	1763.49	16-0 R 3
56707.2	1763.44	17-0 R11
56710.2	1763.35	16-0 R 3
56710.6	1763.34	16-0 R 3
56711.9	1763.30	16-0 P 1
56714.7	1763.21	16-0 R 1
56715.9	1763.18	17-0 R11
56717.4	1763.13	19-0 P15
56717.8	1763.11	16-0 Q 1
56717.9	1763.11	17-0 R11
56719.1	1763.07	16-0 R 1
56721.1	1763.01	18-0 P13
56730.5	1762.72	19-0 R15
56733.6	1762.63	18-0 P13
56734.4	1762.60	18-0 R13
56736.6	1762.53	18-0 P13
56738.9	1762.46	19-0 P15
56740.4	1762.41	17-0 P 9
56747.8	1762.18	17-0 P 9
56748.0	1762.18	18-0 R13
56748.7	1762.15	17-0 P 9



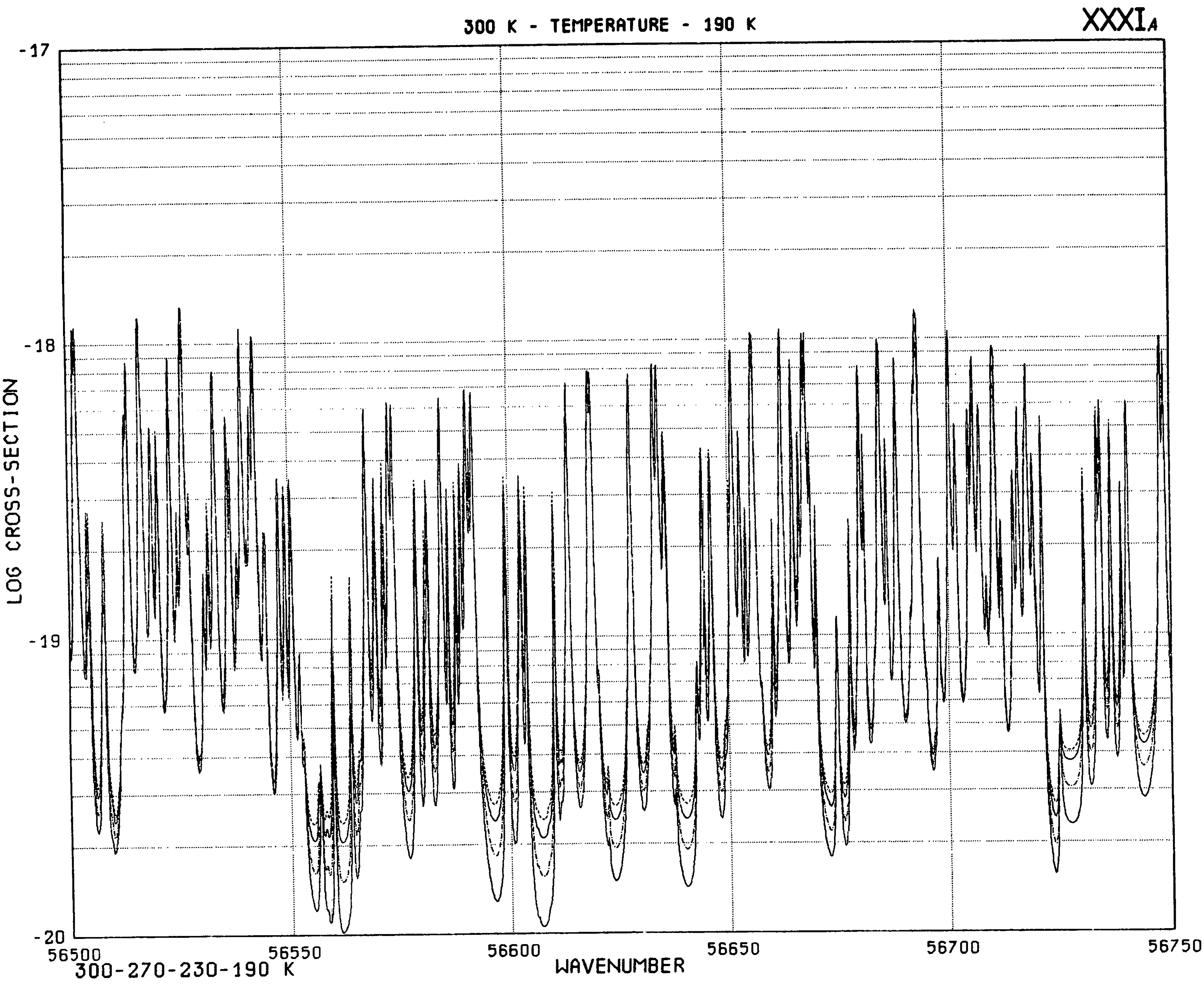
300K
15–0 BAND
R7 TO R3 R1
16–0 BAND
P13 TO R1
17–0 BAND
P17 TO P9
18–0 BAND
P17 P13
19–0 BAND
R19 P19 P15
2
1.10-18
0
CROSS-SECTION
56500
56550
56600
56650
56700
56750
WAVENUMBER



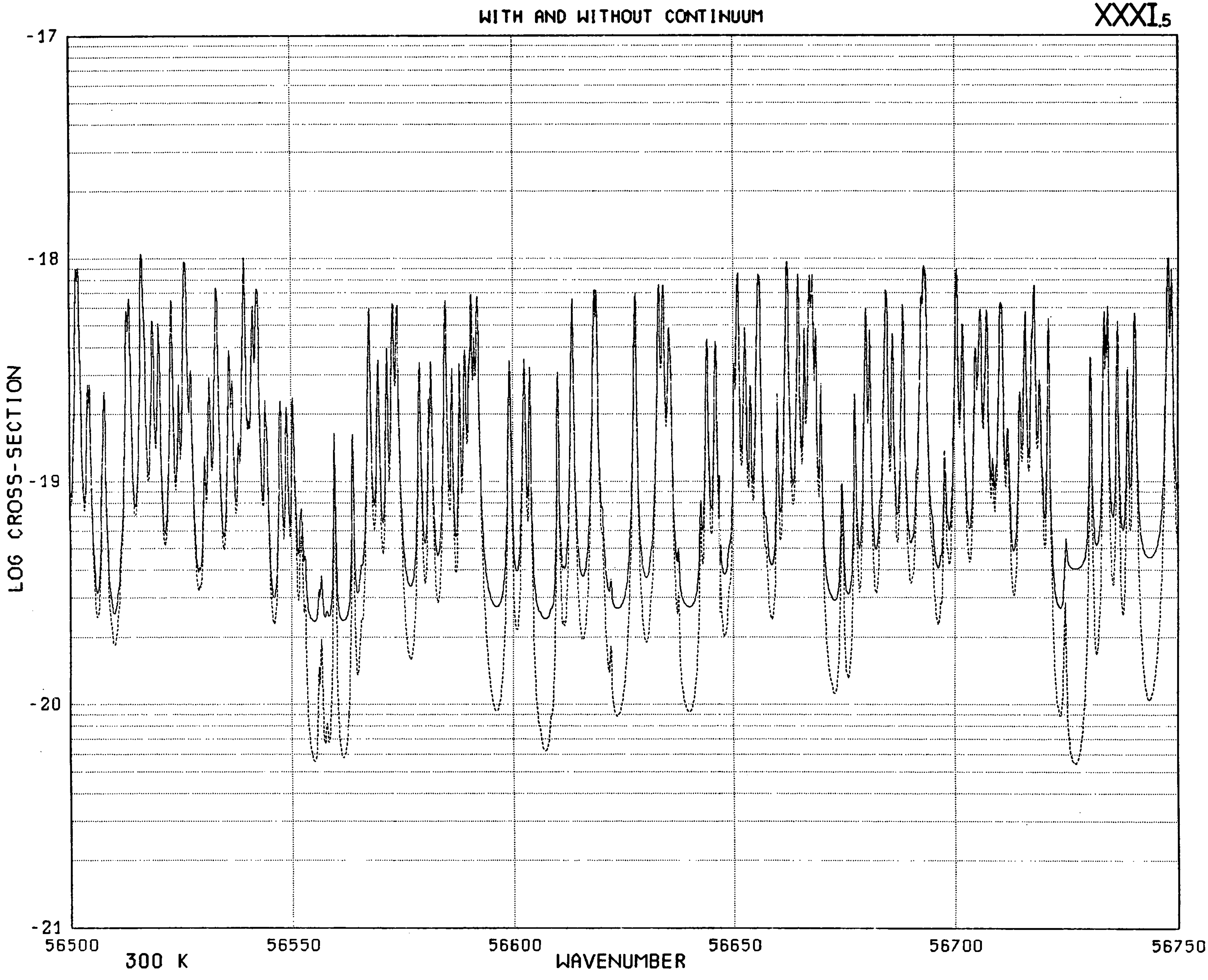
CROSS-SECTION
15-0 BAND FROM R7 TO R1
16-0 BAND FROM P13 TO R1
17-0 BAND FROM P17 TO P9
18-0 BAND FROM P19 TO R13
19-0 BAND FROM P19 TO R15
18-0 BAND O.S.=1.7x10^-5
L.W.=0.3cm^-1
19-0 BAND O.S.=1.3x10^-5
L.W.=0.3cm^-1
LOG SIGMA(O2)
-17
-18
-19
-20
56500
56550
56600
56650
56700
56750
300 K
WAVENUMBER

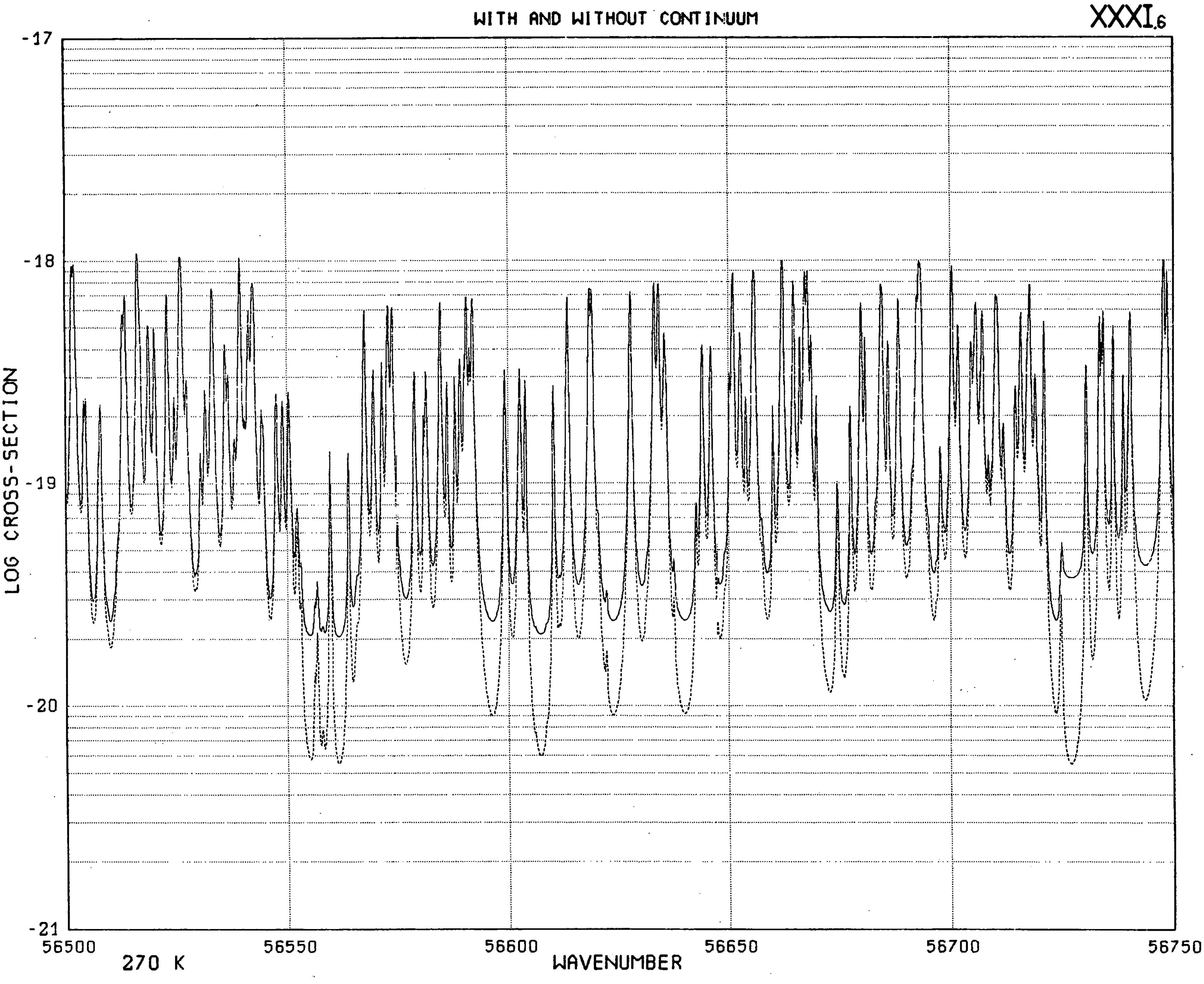


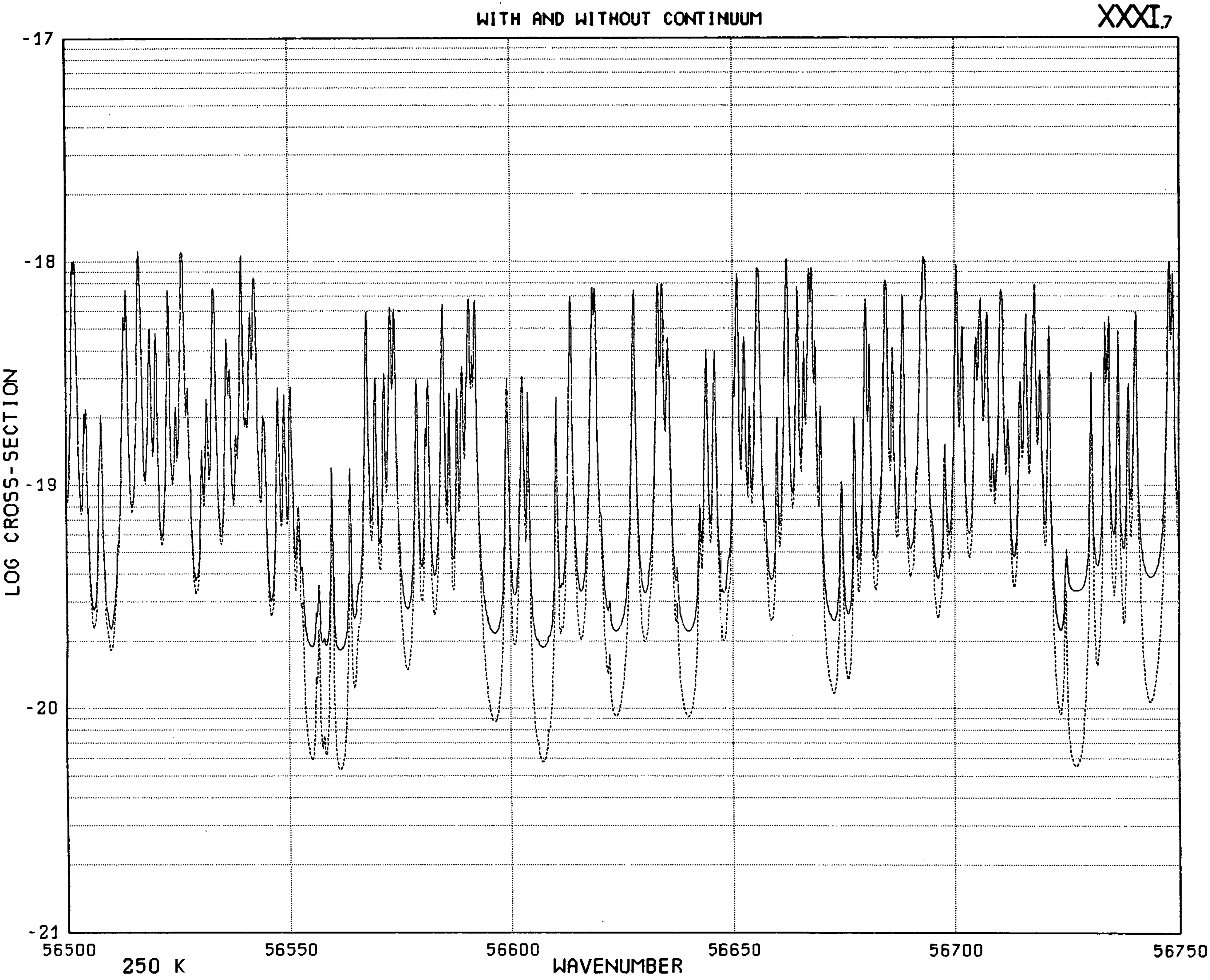
CONTINUUM-VARIATION 10% AND 20%
XXXI3
LOG CROSS-SECTION
-17
-18
-19
-20
56500
56550
56600
56650
56700
56750
300 K
WAVENUMBER

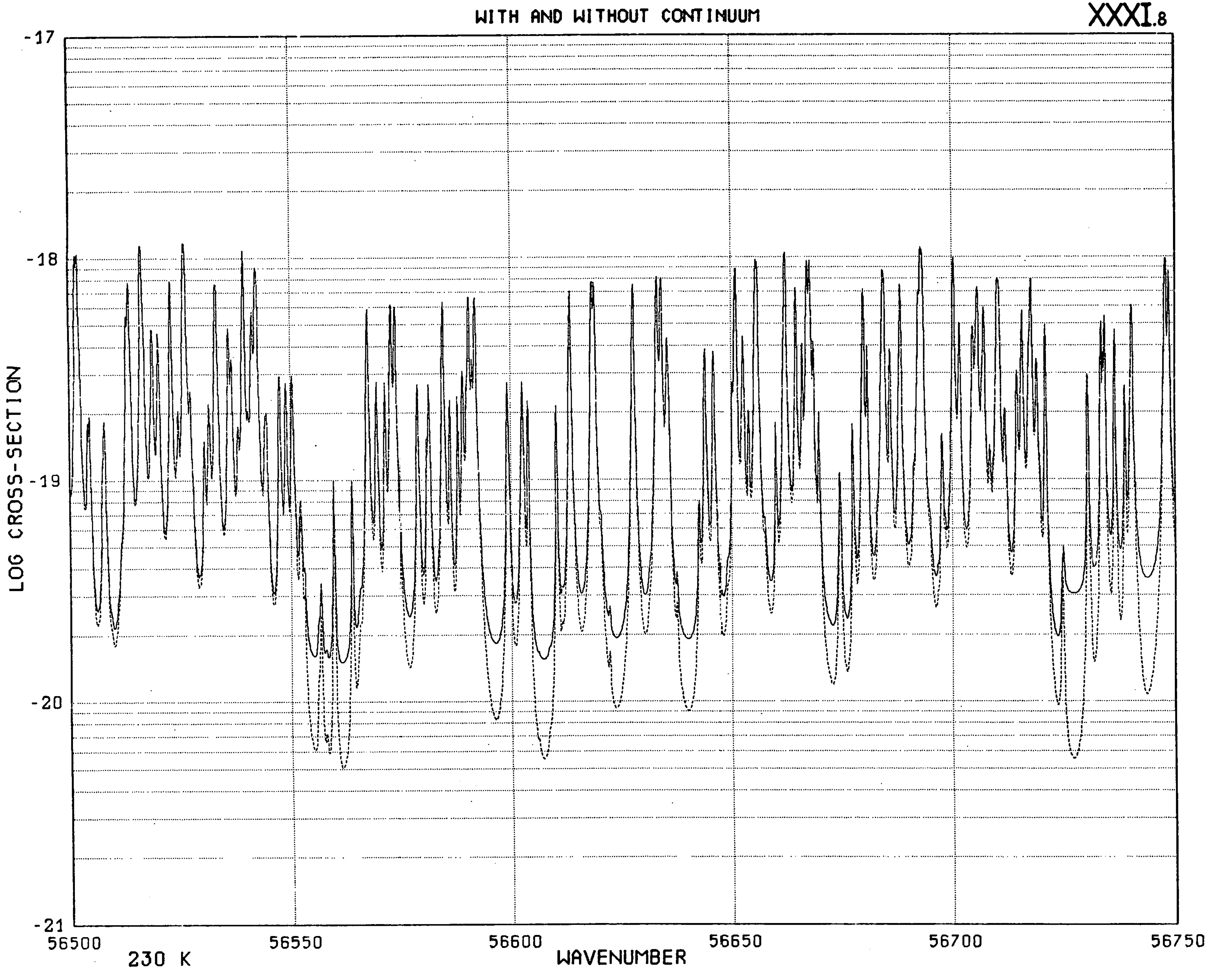


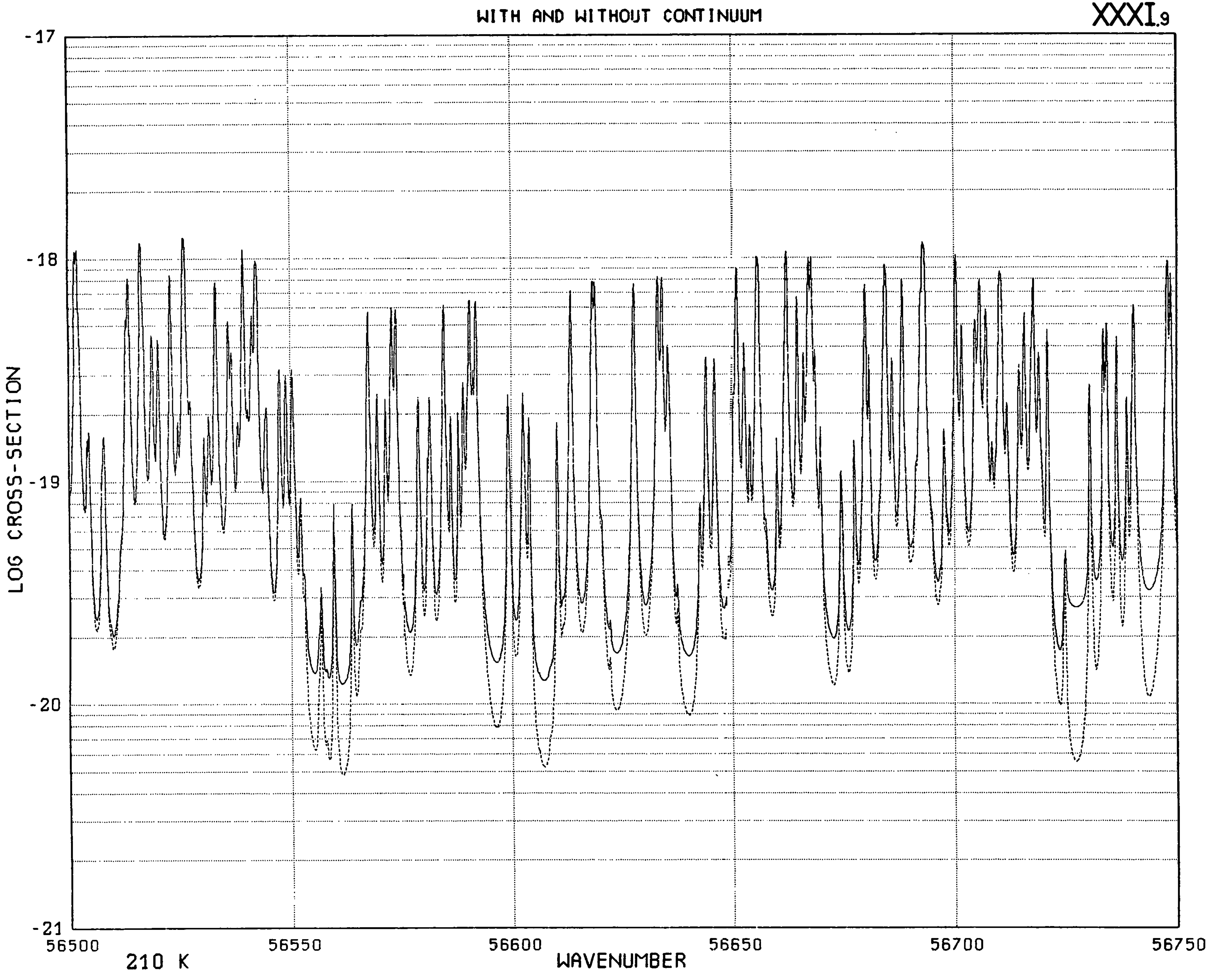
300 K - TEMPERATURE - 190 K
XXXIA
-17
-18
-19
-20
LOG CROSS-SECTION
56500
56550
56600
56650
56700
56750
WAVENUMBER
300-270-230-190 K


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-17
-18
-19
-20
-21
56500
56550
56600
56650
56700
56750
300 K
WAVENUMBER

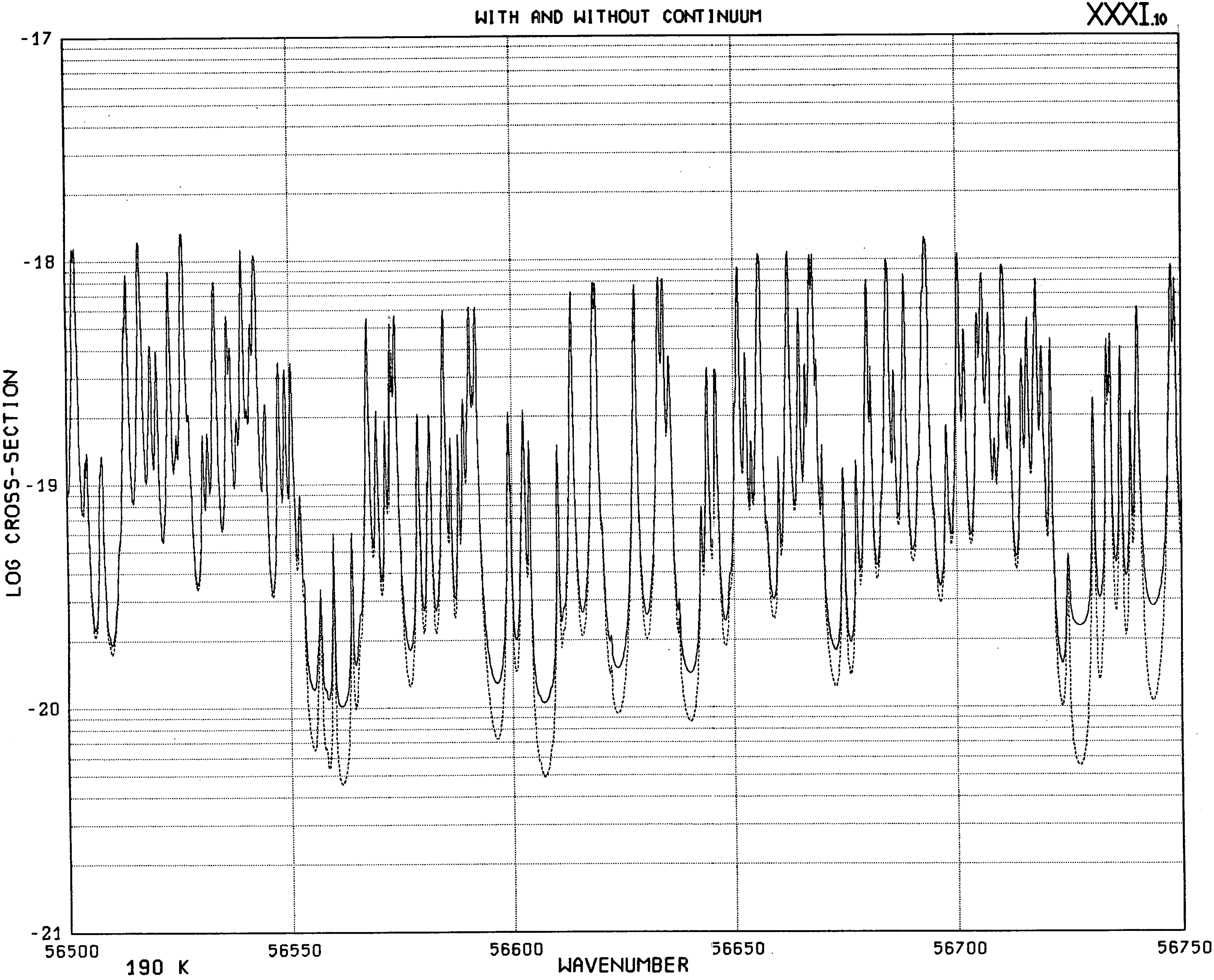

WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56500
56550
56600
56650
56700
56750
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56500
56550
56600
56650
56700
56750
WAVENUMBER
250 K


WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56500
56550
56600
56650
56700
56750
230 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-17
-18
-19
-20
-21
56500
56550
56600
56650
56700
56750
WAVENUMBER
210 K

XXXI.10

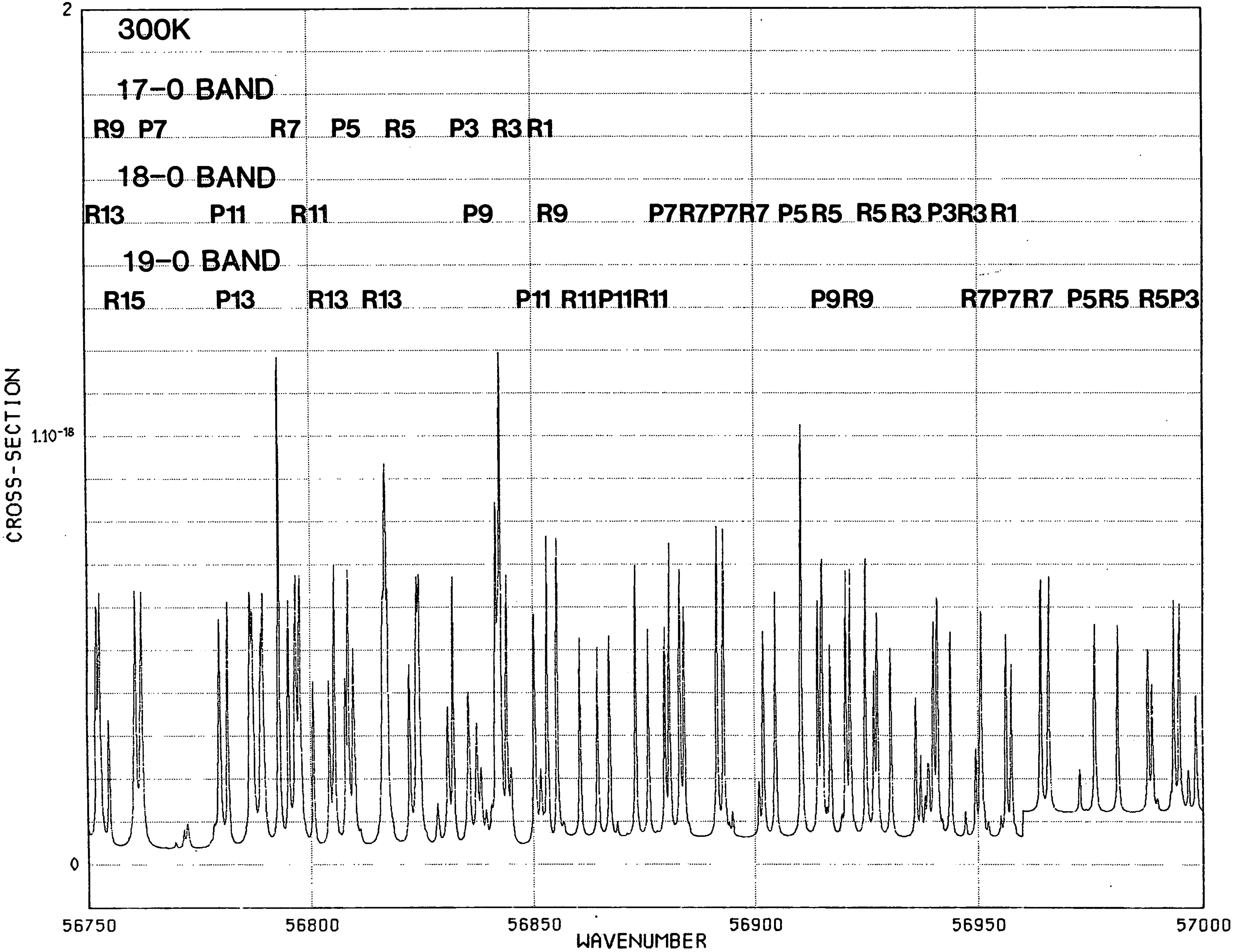

WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56500
56550
56600
56650
56700
56750
WAVENUMBER
190 K

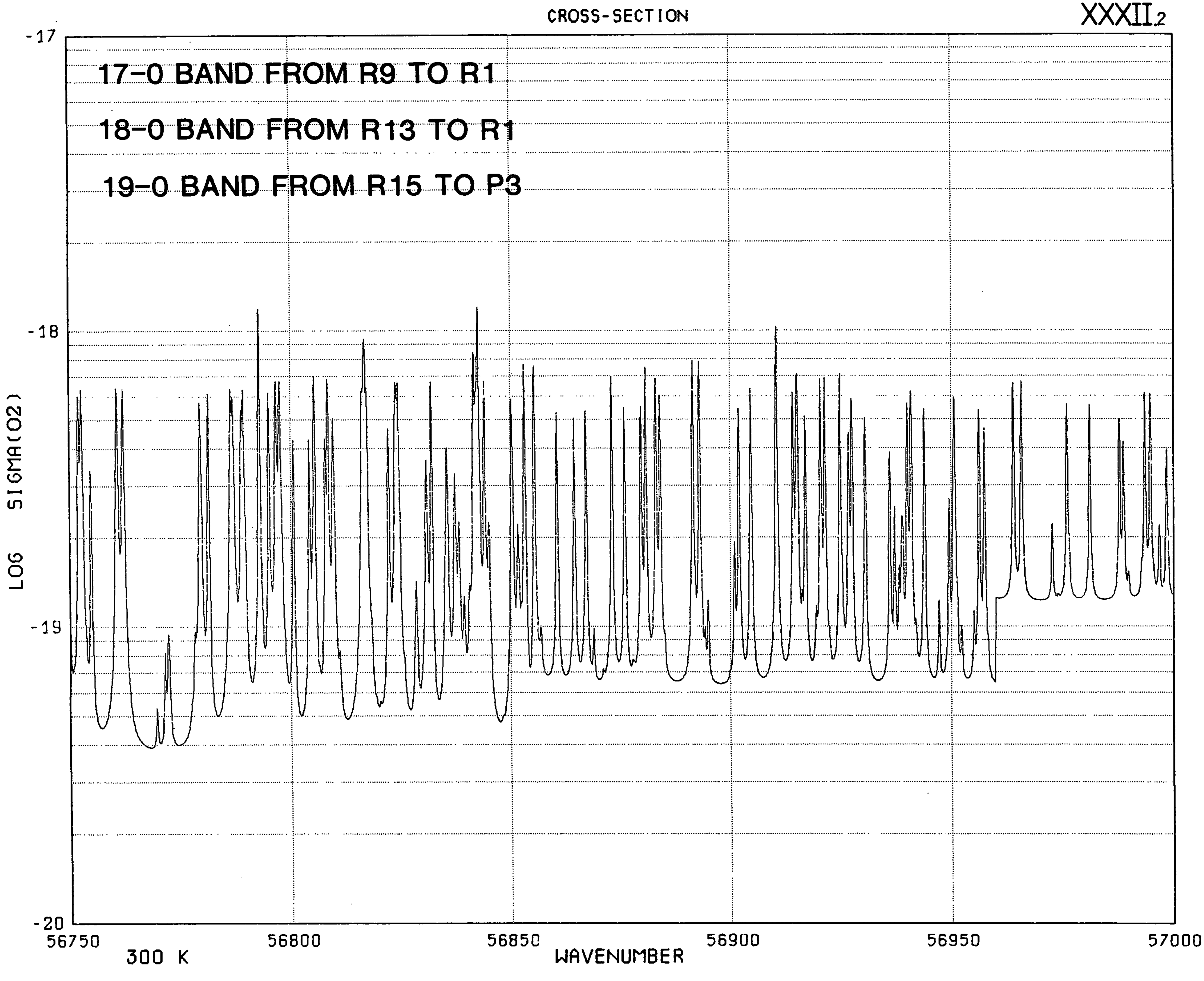
IDENTIFICATION OF O_2 SCHUMANN-RUNGE ROTATIONNAL LINES

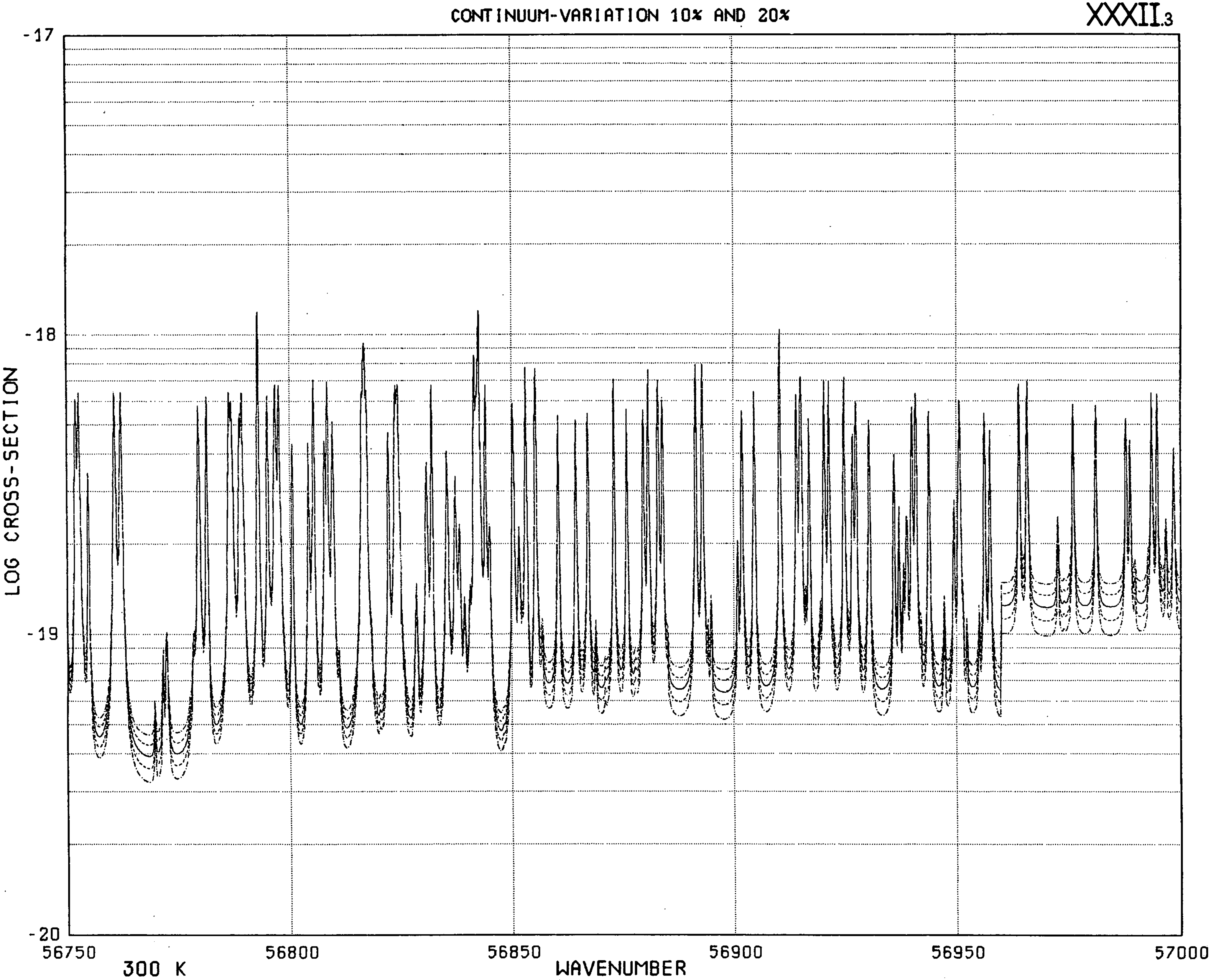
56750 - 57000 cm^{-1}

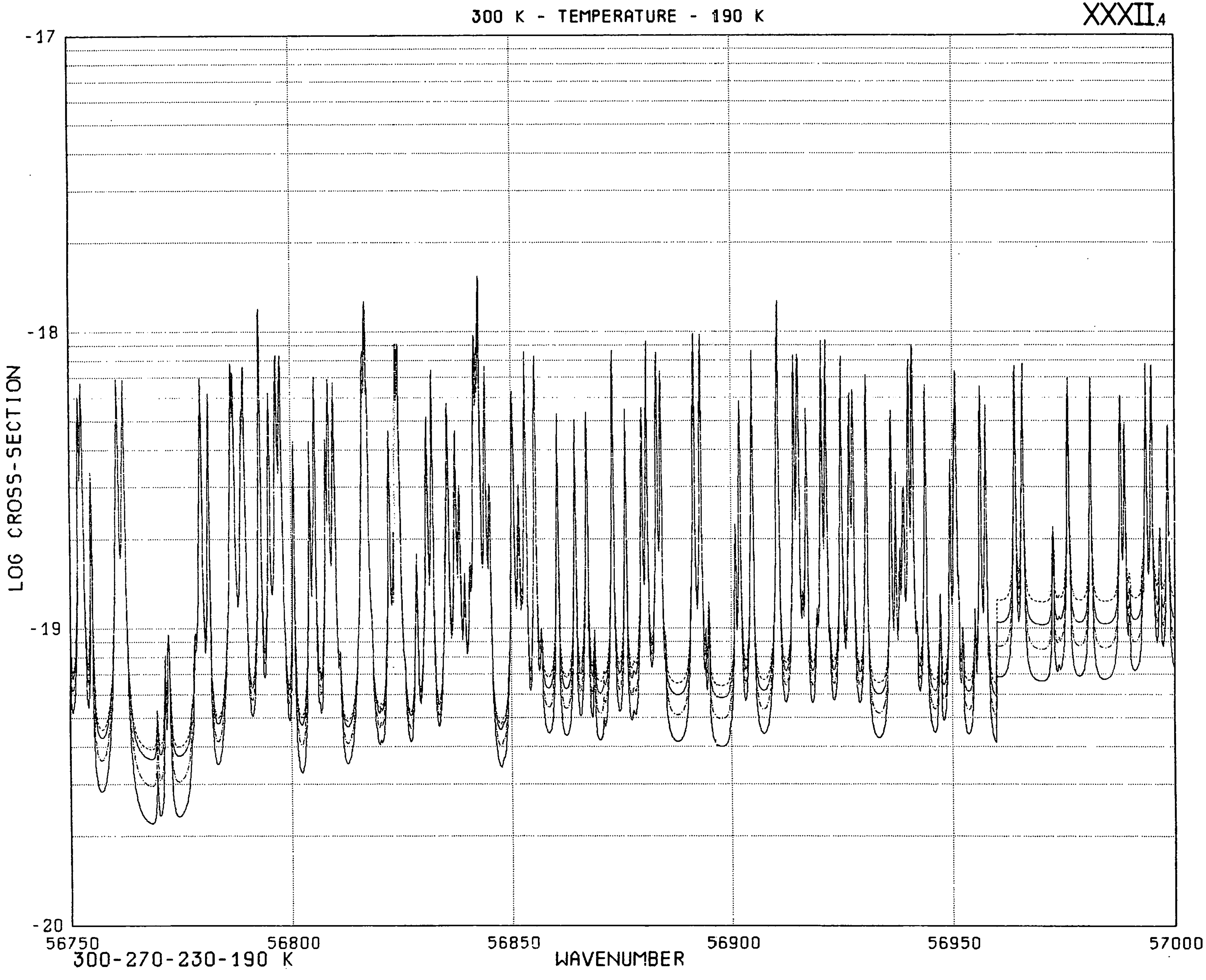
v	λ	band	v	λ	band	v	λ	band
56750								
56752.0	1762.05	18-0 R13	56853.2	1758.92	18-0 R 9	56993.7	1754.58	19-0 R 5
56752.7	1762.03	17-0 R 9	56855.4	1758.85	18-0 R 9	56994.9	1754.54	19-0 R 5
56754.8	1761.96	19-0 R15	56860.5	1758.69	19-0 R11	56998.5	1754.43	19-0 P 3
56760.7	1761.78	17-0 R 9	56864.5	1758.57	19-0 P11			
56762.1	1761.74	17-0 R 9	56867.2	1758.48	19-0 P11			
56779.5	1761.20	17-0 P 7	56873.1	1758.30	18-0 P 7			
56781.3	1761.14	18-0 P11	56876.0	1758.21	19-0 R11			
56786.4	1760.99	17-0 P 7	56879.7	1758.10	19-0 R11			
56787.0	1760.97	17-0 P 7	56880.8	1758.06	18-0 R 7			
56788.8	1760.91	19-0 P13	56883.1	1757.99	18-0 P 7			
56789.3	1760.90	17-0 R 7	56884.0	1757.96	18-0 P 7			
56792.8	1760.79	18-0 P11	56891.5	1757.73	18-0 R 7			
56792.9	1760.78	18-0 R11	56893.0	1757.69	18-0 R 7			
56795.0	1760.72	18-0 P11	56900					
56796.7	1760.67	17-0 R 7	56901.9	1757.41	19-0 P 9			
56797.6	1760.64	17-0 R 7	56904.7	1757.32	18-0 P 5			
56800			56910.4	1757.15	18-0 R 5			
56800.6	1760.55	19-0 R13	56914.2	1757.03	18-0 P 5			
56804.2	1760.43	19-0 P13	56915.0	1757.01	18-0 P 5			
56805.4	1760.40	18-0 R11	56915.2	1757.00	19-0 P 9			
56807.8	1760.32	19-0 P13	56917.0	1756.94	19-0 P 9			
56808.4	1760.30	18-0 R11	56920.4	1756.84	18-0 R 5			
56809.6	1760.26	17-0 P 5	56921.4	1756.81	18-0 R 5			
56816.2	1760.06	17-0 P 5	56924.9	1756.70	19-0 R 9			
56816.7	1760.05	17-0 P 5	56926.7	1756.64	18-0 P 3			
56816.8	1760.04	17-0 R 5	56927.5	1756.62	19-0 R 9			
56817.3	1760.03	19-0 R13	56930.5	1756.53	18-0 R 3			
56822.2	1759.88	19-0 R13	56936.1	1756.36	18-0 P 3			
56823.8	1759.83	17-0 R 5	56937.2	1756.32	18-0 P 3			
56824.4	1759.81	17-0 R 5	56939.0	1756.26	18-0 P 1			
56830.7	1759.61	17-0 P 3	56940.1	1756.23	18-0 R 3			
56832.0	1759.57	18-0 P 9	56940.9	1756.21	18-0 R 3			
56835.5	1759.46	17-0 R 3	56941.0	1756.20	18-0 R 1			
56837.3	1759.41	17-0 P 3	56943.9	1756.12	19-0 P 7			
56838.2	1759.38	17-0 P 3	56949.5	1755.94	18-0 Q 1			
56841.6	1759.27	18-0 R 9	56950					
56842.1	1759.26	17-0 R 3	56950.5	1755.91	18-0 R 1			
56842.6	1759.24	17-0 P 1	56950.8	1755.90	19-0 R 7			
56842.6	1759.24	18-0 P 9	56956.3	1755.73	19-0 P 7			
56842.7	1759.24	17-0 R 3	56957.5	1755.70	19-0 P 7			
56844.1	1759.20	18-0 P 9	56964.1	1755.49	19-0 R 7			
56845.0	1759.17	17-0 R 1	56965.9	1755.44	19-0 R 7			
56850			56976.1	1755.12	19-0 P 5			
56850.3	1759.01	19-0 P11	56981.2	1754.96	19-0 R 5			
56850.5	1759.00	17-0 Q 1	56988.0	1754.76	19-0 P 5			
56851.6	1758.96	17-0 R 1	56988.9	1754.73	19-0 P 5			

IDENTIFICATION

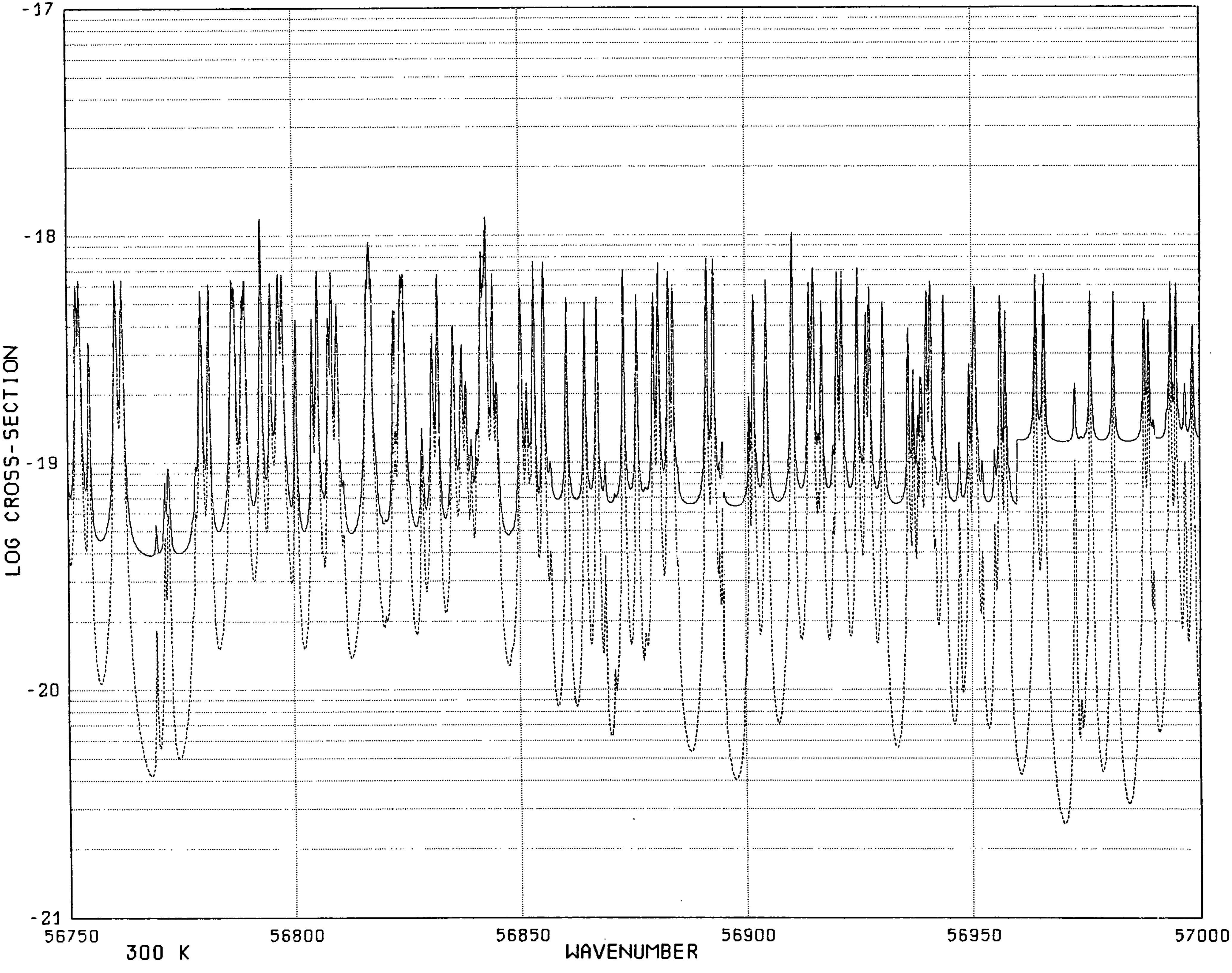


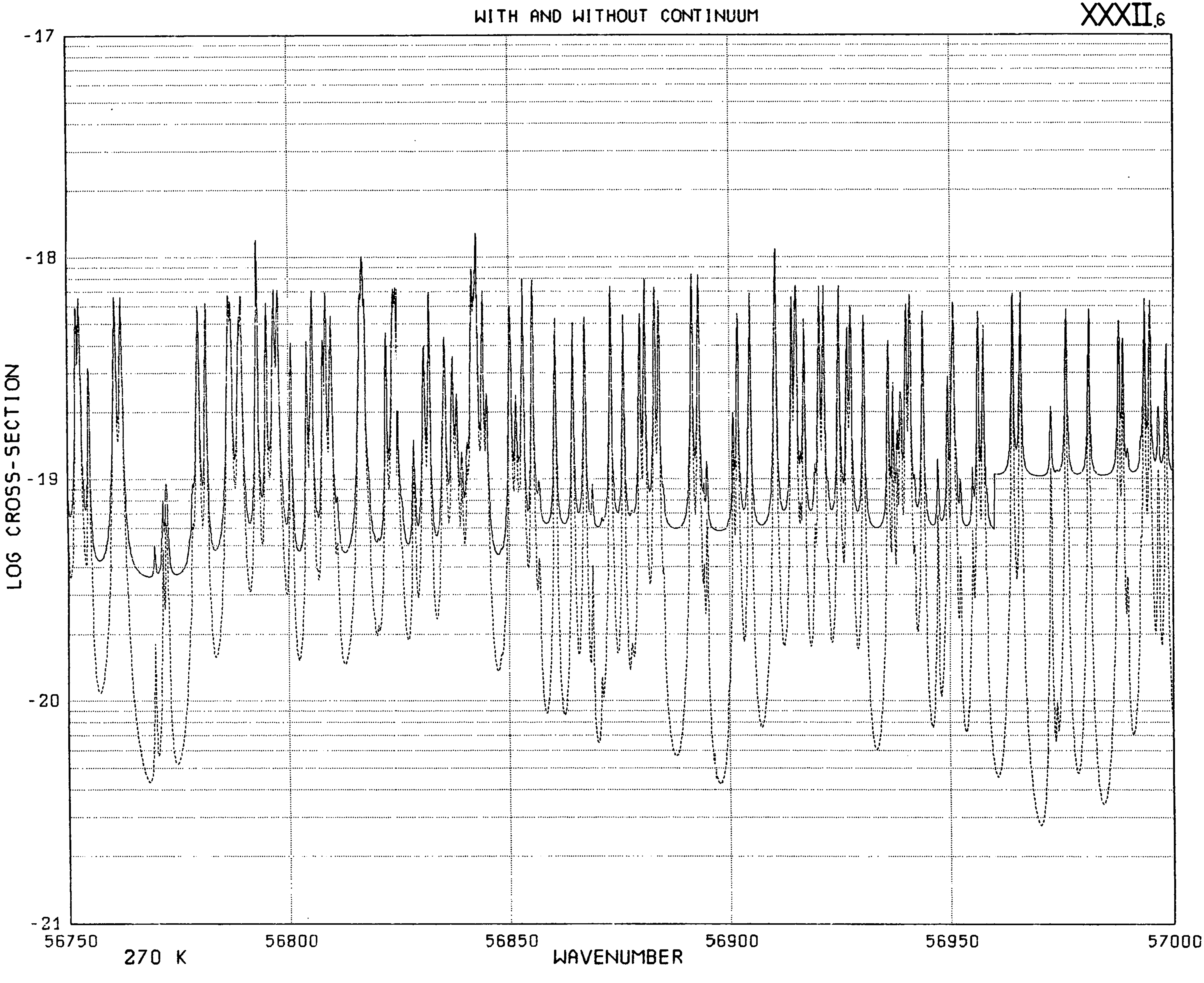

CROSS-SECTION
17-0 BAND FROM R9 TO R1
18-0 BAND FROM R13 TO R1
19-0 BAND FROM R15 TO P3
-17
-18
-19
-20
LOG SIGMA(O2)
56750
56800
56850
56900
56950
57000
300 K
WAVENUMBER

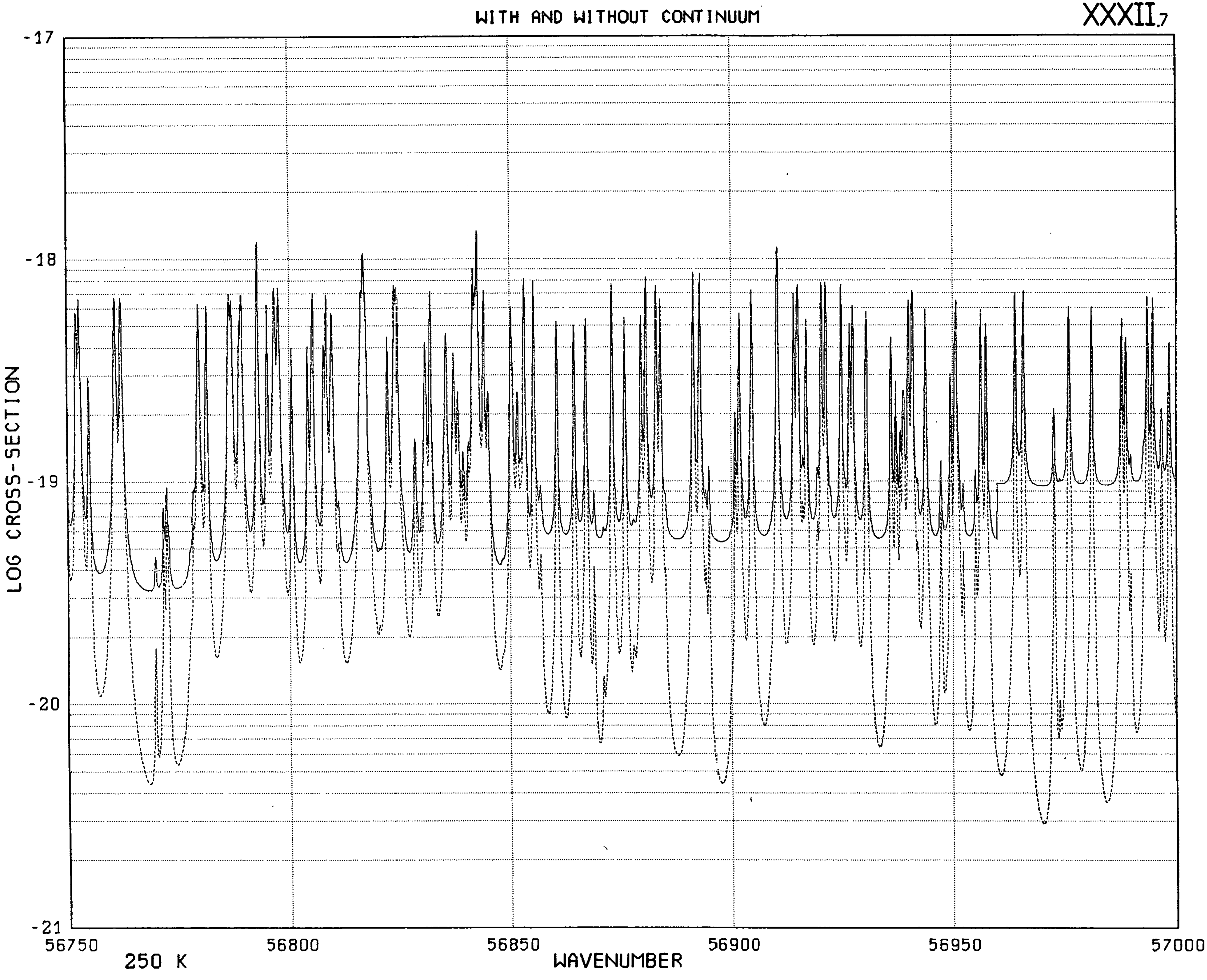

CONTINUUM-VARIATION 10% AND 20%
-17
-18
-19
-20
LOG CROSS-SECTION
56750
56800
56850
56900
56950
57000
300 K
WAVENUMBER

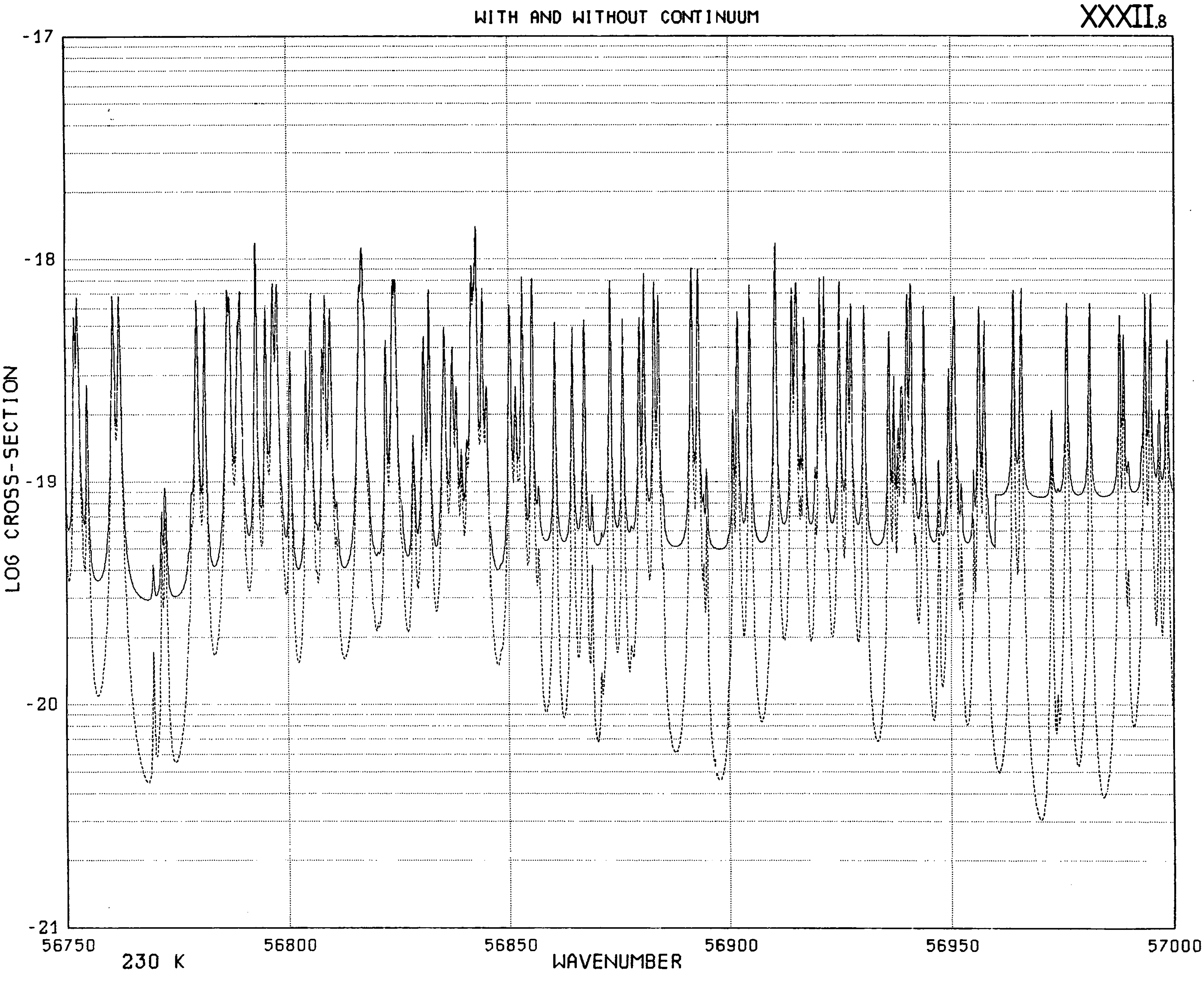

300 K - TEMPERATURE - 190 K
LOG CROSS-SECTION
-17
-18
-19
-20
56750
56800
56850
56900
56950
57000
WAVENUMBER
300-270-230-190 K

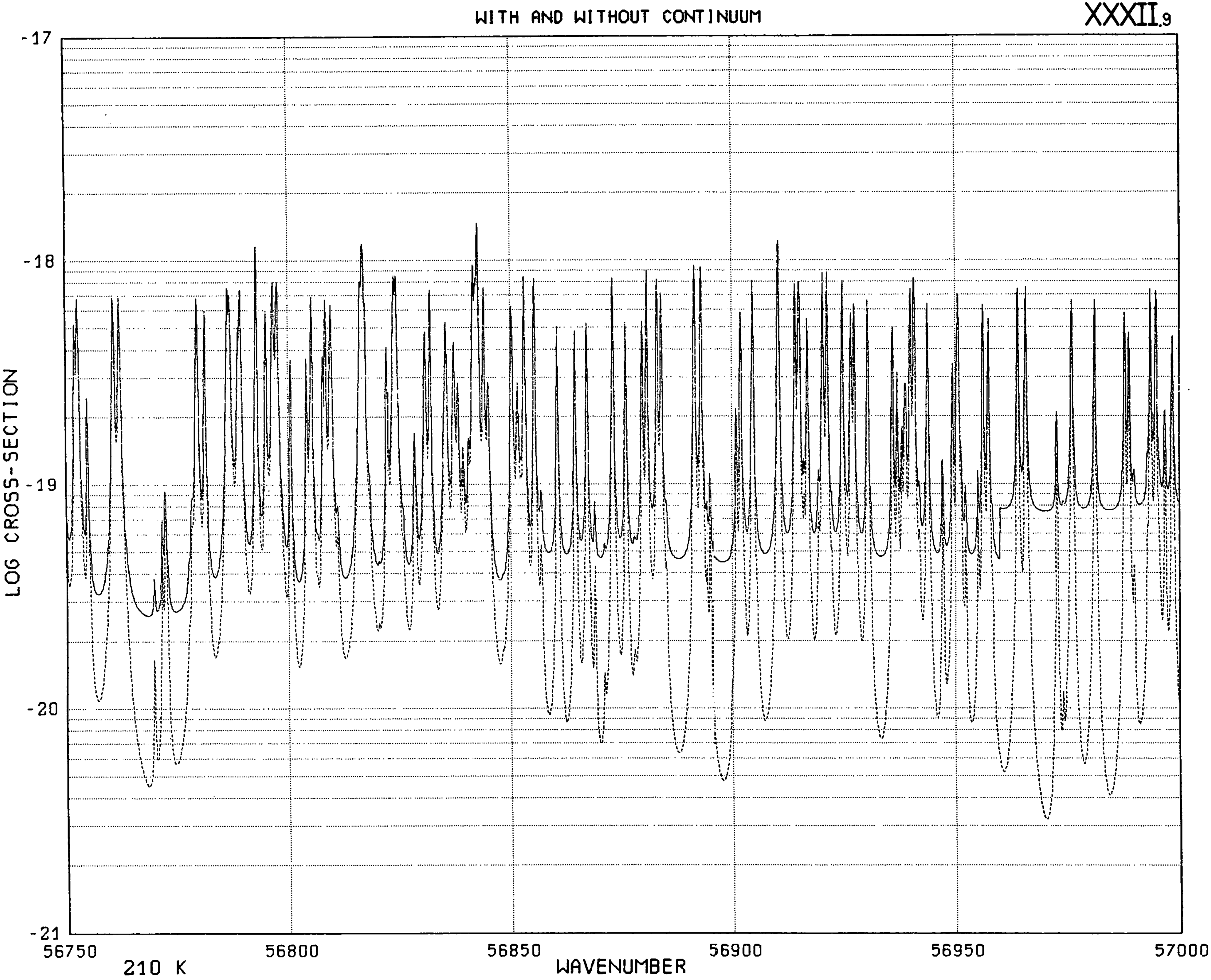
WITH AND WITHOUT CONTINUUM

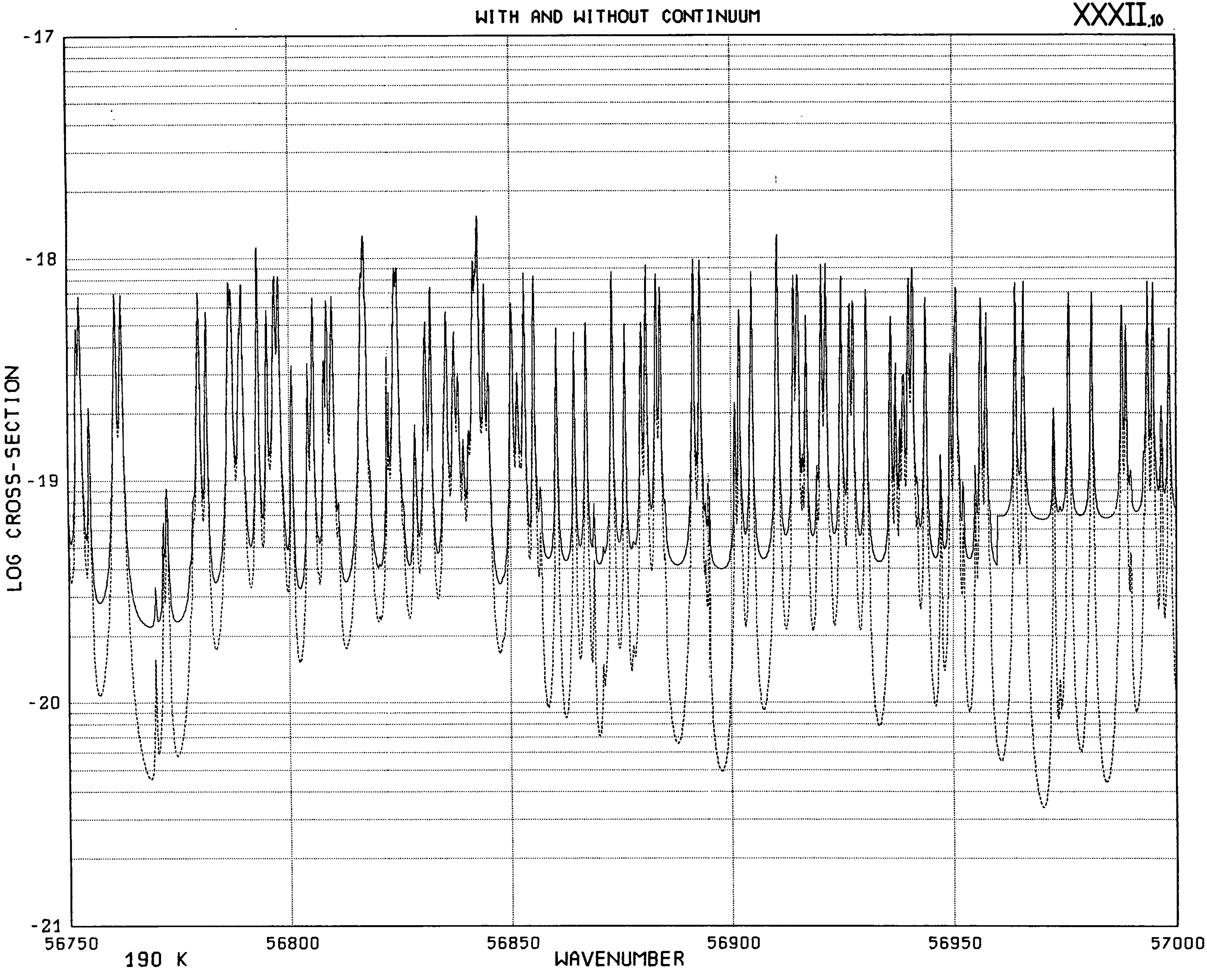



WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56750
56800
56850
56900
56950
57000
270 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56750
56800
56850
56900
56950
57000
WAVENUMBER
250 K


WITH AND WITHOUT CONTINUUM
XXXII.8
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56750
56800
56850
56900
56950
57000
230 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
LOG CROSS-SECTION
-17
-18
-19
-20
-21
56750
56800
56850
56900
56950
57000
210 K
WAVENUMBER


WITH AND WITHOUT CONTINUUM
-17
-18
-19
-20
-21
LOG CROSS-SECTION
56750
56800
56850
56900
56950
57000
190 K
WAVENUMBER