O_3 and NO_2 total column databases at the Jungfraujoch and Harestua NDSC stations from FTIR and DOAS UV/Visible observations: an update.

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Remote sensing measurements of total column amounts by spectroscopic techniques heavily rely on spectroscopic parameters for the target and interfering species, and on a priori vertical profile information. This paper discusses recent updates of O_3 and NO_2 datasets at the Jungfraujoch and Harestua primary and secondary NDSC (Network for Detection of Stratospheric Changes) stations, resp., from high-resolution FTIR (Fourier Transform Infrared) and DOAS (Differential Optical Absorption Spectroscopy) UV/Visible observations. The former are direct-sun absorption measurements throughout the day under clear-sky conditions, the latter are zenith-sky scattered light measurements, daily at twilight. At the Jungfraujoch (ISSJ) the latter are performed with a SAOZ instrument since mid-1990; at Harestua, a home-made, NDSC-qualified instrument has been operated since 1993, on a more or less continuous basis. Two FTIR spectrometers, a Bruker IFS 120HR and a home-made FTS are operated on a regular basis at ISSJ; the FTIR database for NO_2 starts in 1985.

Previous work regarding NO_2 has shown a good agreement between the FTIR and SAOZ databases at ISSJ, and looked at the exploitation of the combined sets (De Mazière *et al.,* 1996a). Since then, updated, T-dependent NO_2 cross-sections have been integrated in the DOAS retrieval algorithm. Also for the FTIR analyses revised sets of spectroscopic parameters have become available in several absorption bands. Therefore, the FTIR data have been re-analysed for NO_2 in several microwindows, and the results have been intercompared amongst them, and with the revised SAOZ data. It is noticed also that the uncertainty about the lower part of the vertical distribution affects the retrieved column to an important degree: benefitting from the distinct information that one can extract from both ground-based techniques, and from correlative space-based measurements (SAGEII, UARS,...), a more reliable estimate is proposed and its effect in both experimental techniques has been evaluated.

As to O_3, previous work has focused on the FTIR spectral microwindows and on the development of climatological models for the O_3 vertical profile in the FTIR analysis

and in the DOAS analysis via the Airmass factors (AMF) (De Mazière *et al.*, 1996b). The latter approaches have been evaluated more carefully. The benefits of ancillary data, and of mutual intercomparisons between colocated experiments are highlighted.

References

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