DETERMINATION OF STANDARDS FOR AN UV MONITORING NETWORK

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Natural and anthropogenic changes of the stratosphere have two important consequences on the biosphere. First, stratospheric ozone is the major absorber of UV-B radiation (280-320 nm) in the Earth's atmosphere and it is known to have damaging effects on biological systems. Processes, either natural or anthropogenic, that cause decreases in stratospheric ozone and therefore cause increases of UV-B radiation are of great concern. Second, biospheric processes are known to affect the concentrations of radiatively active trace gases in the atmosphere. Therefore, consideration must be given to the possibility of indirect effects of the stratosphere on climate that might result from UV-B-produced biospheric effects that could modulate the flux of greenhouse gases into the atmosphere.

The overall objective of this project is to produce practical recommendations for the deployment of an integrated UV-B network throughout Europe. The recommendations will be based on comparison of different methods of

measurement both between and within instrument categories. Three 'European Intercomparison Campaign of UV Spectrometers' were carried out since July 1991 in different European countries. Suitability of instruments and the criteria for a network will be judged by their ability to meet the requirements of the data users : atmospheric modellers, photobiologists, photochemists,...
Recommendations will also be produced for the absolute calibration and the maintenance procedures of the instruments involved in the future network.

In achieving this major aim two other independent objectives need to be met to allow a network based on a number of different instruments. One is the development of a transportable calibration system that can be used for all instruments. The 'Transportable Lamp System' (TLS) has been designed and developed by IASB to meet this goal. The TLS, which is for the moment used as a relative reference, is presently in a final development and evaluation phase. The second is a computational means of normalising the results from instruments with different optical geometry.

A side product of the project will be a data base of UV-B measurements made throughout Europe during the duration of the project. In this field, IASB has build a full automatic UV-B monitoring station which is operational since March 1993, providing UV-B and UV-A measurements every 15 minutes for solar zenith angles lower than 100. While not a unified network, the investigation of measurement techniques and instruments in the project will

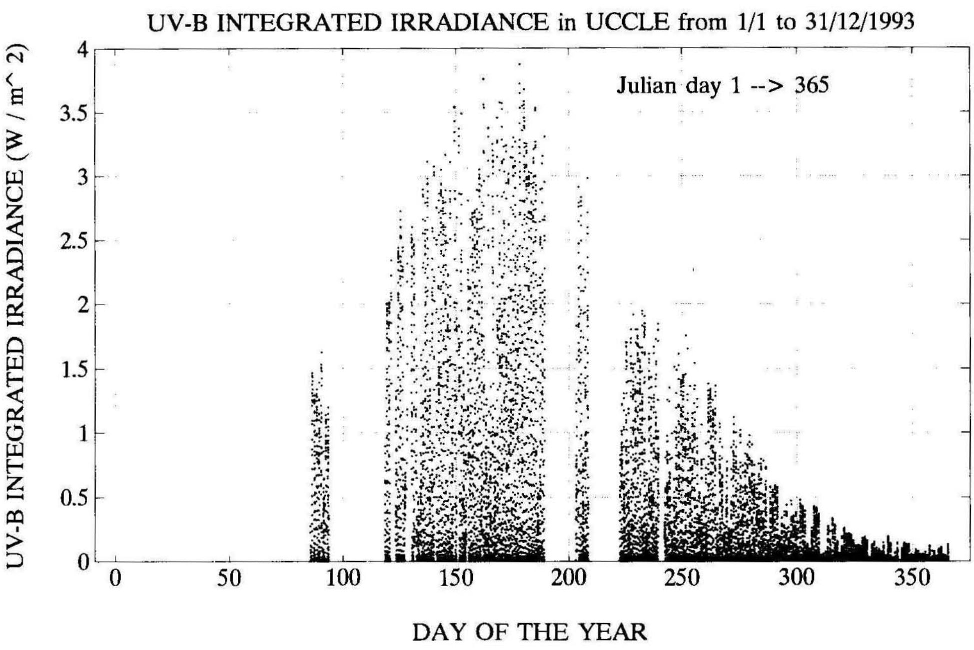

Fig. 1. — UV-B Climatology in Uccle during 1993.

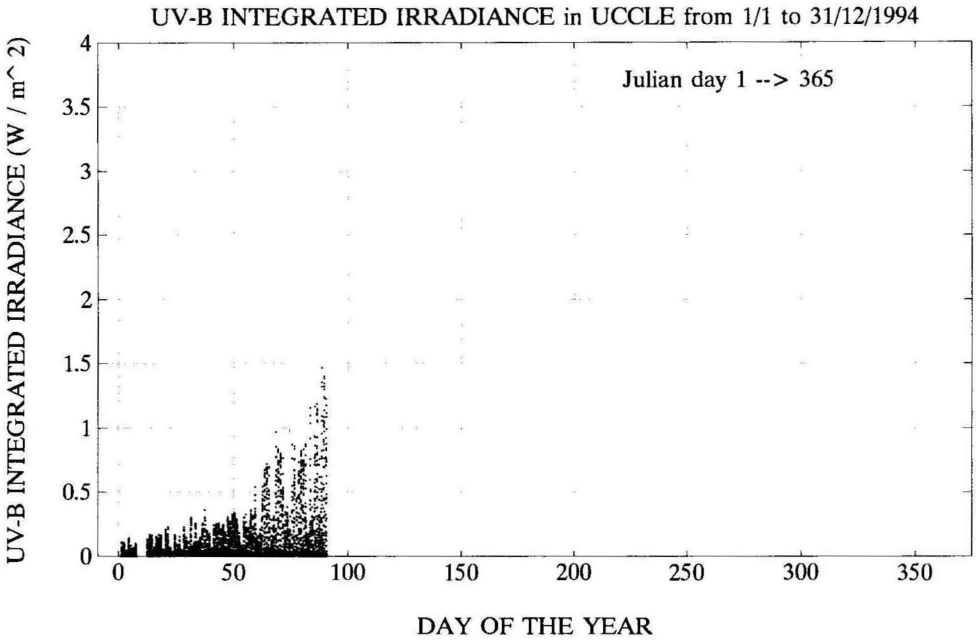

Fig. 2. — UV-B Climatology in Uccle during 1994.

provide compatibility limits between different locations, and allow data from other networks to be used with an acknowledged degree of uncertainty in absolute spectral measurements. The other networks can also provide information on the level of various atmospheric constituents which together with the measured UV-B irradiances should aid the understanding of UV radiative transfer.

References

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