



Analysis of an extensive time series of UV irradiation and AOD measurements in the UV-B region at Uccle, Belgium

V. De Bock and H. De Backer

Royal Meteorological Institute of Belgium, Ringlaan 3, B-1180 Uccle (Veerle.DeBock@meteo.be)

A study performed by De Backer in 2009 analysed the daily erythemal doses, total solar radiance, total ozone and AOD at 320nm from Uccle, between 1990 and March 2007. The study showed that there is a high correlation between the daily erythemal doses and the total solar radiation. Although the correlation coefficients between the erythemal UV doses and total ozone are higher than those between the erythemal UV-B doses and the AOD at 320nm, the sensitivity of the UV dose is larger for AOD.

Since this study has been performed, some changes have been made to the method of AOD retrieval. The most important change is the introduction of a new cloud screening method, applied to the AOD at 320nm. The resulting AOD are more reliable than before and the influence of clouds is removed. Using the measurements from the Brewer#016 spectrophotometer at Uccle, an extensive and updated AOD time series from 1984 until 2011 can now be analysed together with other parameters, such as the daily erythemal doses, total solar irradiance and total ozone. The temporal evolution of the different parameters and the AOD will be shown together with a reanalysis of the influence of the AOD on the erythemal UV.

At Uccle, we also developed a method to retrieve AOD at 340nm using sun scan measurements (De Bock et al. 2010). With these AOD at 340nm and UV irradiation measurements, we will attempt to derive the single scattering albedo for cloudless days at Uccle.

References:

De Backer, H., Time series of daily erythemal doses at Uccle, Belgium, International Journal of Remote Sensing, volume 30, issue 1516, 4145-4151, doi: 10.1080/01431160902825032, 2009

De Bock, V., De Backer, H., Mangold, A. and Delcloo, A., Aerosol Optical Depth measurements at 340 nm with a Brewer spectrophotometer and comparison with Cimel observations at Uccle, Belgium, Atmos. Meas. Tech., 3, 1577-1588, doi:10.5194/amt-3-1577-2010, 2010.