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# Ultraviolet Radiation Measurements in Athens

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ABSTRACT

This paper presents the results of an analysis of solar ultraviolet irradiance and broadband global irradiance data, measured at the National Observatory of Athens ($37^o$ 58´ N, $23^o$ 43´ E) from April 1993 to December 1996. Hourly and daily integrated UV irradiance $R_{UV}$ (295-385 nm) recorded by a TUVR Eppley radiometer and global irradiance $R_T$ (295-2800) from an Eppley precision spectral pyranometer were found highly correlated during all the year ($R^2$ ranged from 0.834 to 0.972 for daily values and from 0.946 to 0.980 for hourly values). The ratio $R_{UV}$ / $R_T$ varied from 2.85% to 3.57% for hourly values and had an average value of 3.39% for daily values. In order to improve the estimation error and reduce the local character in any relationship between $R_{UV}$ and $R_T$, dimensionless parameters were used. Thus, in correspondence to the clearness index $k_T$ (defined as the ratio of the total irradiation on a horizontal surface to the extraterrestrial solar irradiation on a horizontal surface), a clearness index for the UV spectral range $k_{TUV}$ was also taken into account in the analysis. $k_{TUV}$ was found to range from 0.212 to 0.353 for daily values and from 0.209 to 0.446 for hourly values. A general linear relation $k_{TUV}$=a $k_T$ was examined and the coefficient of determination was greater than 0.820 for daily values and 0.886 for hourly values. On average, the value of the UV clearness index $k_{TUV}$ was evaluated approximately as 56.8% of the value of the clearness index for the whole spectrum, for hourly values.