

TOTAL COLUMN OZONE AND SOLAR UV-B ERYTHEMAL IRRADIANCE OVER KISHINEV, MOLDOVA

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ABSTRACT

Results of the total column ozone and ultraviolet UV-B erythemal weighted irradiance measurements at the ground-based solar monitoring station at the Kishinev, Moldova ($\varphi=47.0013^{\circ}\text{N}$, $\lambda_0=28.8156^{\circ}\text{E}$, $h=205$ m a.s.l.) are presented. Ozone content was retrieved from the direct solar ultraviolet radiation measurements at 3 discrete wavelengths, 305-, 312-, 320-nm within UV-B range, which are regularly carried out with hand-held MICROTOPS II Ozonemeter, Solar Light Co. Total column ozone trend gives the value of ~ -6 D.U./decade, which was obtained on the basis of multiyear (1978-2004) statistics from EP TOMS platform measurements. Monthly average values of total column ozone content measured with hand-held MICROTOPS II at the Kishinev are in close agreement with those ones retrieved from the multiyear (1978-2004) database statistics acquired from the Earth Probe Total Ozone Mapping Spectrometer (EP TOMS) satellite platform measurements. Measurements of total column ozone made with MICROTOPS at the Kishinev site from September 2003 to August 2004, revealed maximum and minimum of daily means of ozone with values of ~ 489 D.U. (on February 12, 2004) and ~ 259 D.U. (on December 3, 2003), respectively.

Continuous solar radiation measurements from UV-B to IR have been carrying out at the solar radiation monitoring station established in an urban environment of Kishinev since October 2003. Diffuse and global components of the UV-B erythemal irradiance are continuously measured with two sensors UV-S-B-C (of broadband 280-315 nm), Kipp&Zonen. Period of observation was chosen from October 2003 to September 2004. Results of measurements of the monthly totals of global and diffuse components of solar UV-B erythemal radiation (with UV-S-B-C sensors of broadband 280-315 nm) on horizontal plane are presented. It was shown seasonal variation of these components with the presence of minimum (for winter season) and maximum (for summer) of their values. It was shown the influence of the number of overcast days upon the variation of the monthly totals of sunshine duration. The regression relationship of the scattergram for global and diffuse components of solar UV-B erythemal radiation measured for cloud free days may be represented by second order polynomial regression curve. The regression coefficient at term of order two has strong dependence on aerosol optical thickness measured with the sunphotometer Cimel-318 at $\lambda=500$ nm: this coefficient decreases with increasing of the aerosol optical thickness; coefficient at term of order one is practically independent on aerosol optical thickness, and free term is negligible one.