ONE YEAR MONITORING OF THE SOLAR IRRADIANCE IN AN URBAN ENVIRONMENT OF KISHINEV, MOLDOVA

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For the first time in Moldova it was established ground-based station for continuous solar radiation monitoring. The station was placed in an urban environment of Kishinev (φ=47.0013^{0}N, λ_o=28.8156^{0}E, h=205 m a.s.l.). Station was equipped with the solar radiation sensors for broadband measurements of radiation from UV-B to IR, data logger CR10X, and active solar tracker unit 2AP BD (Kipp&Zonen). Suite of sensors, such as UV-B, UV-A, PAR Lite, SP Lite, CM-11 and CG-1 for measuring of solar and atmosphere radiation, were mounted at the stationary platform. Diffuse and direct components of solar radiation are measured with sensors (UV-B, CM-11) and CH-1, respectively, installed on a moving platform of the active solar tracker 2AP BD. These instruments were assembled into the multifunctional radiometric complex. Additional instruments, such as an automatic weather station MiniMet, hand-held ozonemeter MICROTOPS II, and sunphotometer Cimel-318, are also used at the station. Data sets acquired from weather station MiniMet (Sky Instruments Ltd.), which is arranged at a distance of 30 meters apart from the radiometric measuring complex, supplement the solar radiation measurements. Total column ozone is regularly measured at the station by hand-held ozonemeter MICROTOPS II, (Solar Light Co). Sunphotometer makes measurements of the spectral direct Sun and diffuse sky radiances to retrieve aerosol optical properties in frames of the Aerosol Robotic Network (AERONET) program, NASA/GSFC.

First data obtained from continuous measurements of the solar radiation from UV-B to IR are analyzed. 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 radiation (with CM-11 sensors of broadband 305-2800 nm) and 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 $<\tau_a(500)>$ which was measured with the sunphotometer Cimel-318 at λ=500 nm. This coefficient decreases with increasing of the aerosol optical thickness. Coefficient at term of order one is practically independent on $<\tau_a(500)>$, and free term is negligible one. Measured values of aerosol optical thickness were used to select days applicable for analysis of mutual relationship between global and diffuse components of the solar UV-B radiation and to retrieve aerosol microphysical properties.