Geophysical Research Abstracts,
Vol. 11, EGU2009-3731, 2009
EGU General Assembly 2009

Analysis of erythemally effective UV radiation at the Mendel Station, James Ross Island in the period of 2006-2007

K. Laska (1), P. Prosek (1), L. Budik (2), and M. Budikova (3)

(1) Masaryk University, Department of Geography, Brno, Czech Republic (laska@sci.muni.cz, +420 549491490), (2) Czech Hydrometeorological Institute, Brno Regional Office, Czech Republic (budik@chmi.cz, +420 541421025), (3) Masaryk University, Department of Mathematics and Statistics, Brno, Czech Republic (budikova@sci.muni.cz, +420 549493335)

The results of global solar and erythemally effective ultraviolet (EUV) radiation measurements are presented. The radiation data were collected within the period of 2006-2007 at the Czech Antarctic station J. G. Mendel, James Ross Island (63°48'S, 57°53'W). Global solar radiation was measured by a Kipp&Zonen CM11 pyranometer. EUV radiation was measured according to the McKinley and Diffey Erythemal Action Spectrum with a Solar Light broadband UV-Biometer Model 501A. The effects of stratospheric ozone concentration and cloudiness (estimated as cloud impact factor from global solar radiation) on the intensity of incident EUV radiation were calculated by a non-linear regression model. The total ozone content (TOC) and cloud/surface reflectivity derived from satellite-based measurements were applied into the model for elimination of the uncertainties in measured ozone values. There were two input data of TOC used in the model. The first were taken from the Dobson spectrophotometer measurements (Argentinean Antarctic station Marambio), the second was acquired for geographical coordinates of the Mendel Station from the EOS Aura Ozone Monitoring Instrument and V8.5 algorithm. Analysis of measured EUV data showed that variable cloudiness affected rather short-term fluctuations of the radiation fluxes, while ozone declines caused long-term UV radiation increase in the second half of the year. The model predicted about 98 % variability of the measured EUV radiation. The residuals between measured and modeled EUV radiation intensities were evaluated separately for the above-specified two TOC datasets, parts of seasons and cloud impact factor (cloudiness). The mean average prediction error was used for model validation according to the cloud impact factor and satellite-based reflectivity data.