



Comparison of total UV and erythemally effective UVB radiation at the Mendel and Vernadsky stations, Antarctica

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In this contribution, the results of the first year of measurements of the intensity of total ultraviolet and erythemally effective UVB radiation are presented. The radiation data were collected simultaneously at the Czech Mendel Station, James Ross Island and Ukrainian Vernadsky Station, Galindez Island, Argentine Islands within the period of 2005-2006. The measurements were made using a broadband CUV3 radiometer (Kipp & Zonen, the Netherlands) and UV-Biometer Model 501 (Solar Light Inc., USA). Global solar radiation was measured by a pyranometer CM11. The impact of stratospheric ozone concentration, cloud types and cloudiness on incident UV were examined. Occurrence of the clouds was analyzed as an effect of the atmospheric circulation types. The above-mentioned factors caused high variability of both total UV and UVB erythemally effective radiation. The results of measurements are presented at the level of daily sums and seasonal fluctuations. Special attention was devoted to the analysis of ozone depletion effect. Period from January to May (prior to the beginning of ozone depletion) and from August to December (during ozone depletion) were compared in details. The effects of these factors were evaluated by (1) linear regression model, (2) radiative transfer model, and (3) correlation analysis. The model outputs confirmed the different influence of the above-specified independent variables (factors) on incident UV radiation. The most significant factor was cloudiness and cloud types. The obtained data confirmed an assumption of the different influence of the analyzed factors between western and eastern coast of the Antarctic Peninsula.