



## **Prediction of erythemally effective UV Radiation by Means of nonlinear regression Model**

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Measurement of different radiation fluxes (i.e. global solar radiation and global UV radiation intensity) has been one of the Czech-Ukrainian scientific cooperation carried out at the Vernadsky Station (formerly British Faraday Station) in the Antarctica since 2002. A special attention was devoted to erythemally effective UVB radiation. This contribution includes the results of modelling of the erythemally effective UVB radiation (daily sums of energy) in relation to (1) total ozone content, (2) extraterrestrial and (3) incident global solar radiation, and (4) extraterrestrial intensity of the UVB radiation. The total ozone content (TOC) values from both ground and satellite measurements were applied to eliminate the uncertainties in measured ozone concentration. The first TOC series was taken from the Dobson spectrophotometer measurements; the second was acquired for geographical coordinates of the Vernadsky Station from the daily gridded ozone data (EPTOMS Version 8). Two types of empirical models (linearizable and nonlinearizable) for prediction of the UVB radiation are compared. To estimate parameters of nonlinearizable (hyperbolic) model, the input data transformation was used. Thus, the distribution of residuals is much closer to the normal distribution. Moreover, the correlation field of dependencies between measured and predicted values is homoskedastic. Both regression models are verified separately for different total ozone values and seasons. Comparison of these models is aimed at their behaviour under extremely low and high ozone concentrations in polar atmosphere.

Therefore it is easier to examine limitations and qualities of both models.