



## **Testing of simple empirical model for UV-ERY estimating at selected European stations**

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Within the submitted study a simple model for the estimation of daily erythemal UV dose (UV-ERY) was tested. This model requires daily global and extraterrestrial solar radiation, total amount of stratospheric ozone and coordinates of the selected station as an input data. The model was originally developed and calibrated for central European region using measurements at eight Austrian stations for the period of 2000 and 2002 and additionally verified at three sites in the Czech Republic.

The main aim of the study was to assess the performance of this simple model for stations out of Central European regions. Also the behavior and accuracy of this tool was compared with more advanced Deutscher Wetterdienst's (DWD's) method in UV index forecasting. Measurements used for the verification were observations of the selected locations for the period from 1999 and 2002 except Potsdam where only the year 2002 was available and Belsk where the period from 1976 to 2004 was used.

Results of empirical model at Bergen (Norway) and Belsk (Poland) are in good agreement with measurements when MBE (Mean bias error) is 61.1 J/m<sup>2</sup>/day respectively 44.7 J/m<sup>2</sup>/day and RMSE (Root mean square error) is 125.4 J/m<sup>2</sup>/day respectively 136.9 J/m<sup>2</sup>/day. For Potsdam (Germany), Thessaloniki (Greece) and especially Davos (Switzerland) the empirical model gives lower values against measurements when MBE vary from 157.2 J/m<sup>2</sup>/day to 411.4 J/m<sup>2</sup>/day and RMSE vary from 215.6 J/m<sup>2</sup>/day to 527.0 J/m<sup>2</sup>/day. DWD's method gives smaller scattering between simulated and observed data when MBE vary from 41.0 to -190.6 J/m<sup>2</sup>/day and RMSE vary from 105.3 J/m<sup>2</sup>/day to 235.3 J/m<sup>2</sup>/day. DWD's method was not applied to the

Belsk data because of not appropriate data format.

It can be concluded that simple empirical model might provide a reasonably accurate values considering their uncomplicated approach and data availability. For some locations, the model does not need any further calibration (e.g. Bergen, Belsk) and in other cases (e.g. Davos) acceptable accuracy could only be obtained after site based re-calibration.

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