EMS Annual Meeting Abstracts,
Vol. 6, EMS2009-383, 2009
9th EMS / 9th ECAM

9th EMS Annual Meeting
9th European Conference on Applications of Meteorology
High resolution meteorology
- applications and services

Investigation of spectrally resolved actinic flux in mountainous terrain

J.E. Wagner (1), M. Blumthaler (2), M. Fitzka (1), J.P. Gobbi (3), R. Kift (4), A. Kreuter (2), H.E. Rieder (5), S. Simic (1), A. Webb (4), and P. Weihs (1)

(1) BOKU - Universität für Bodenkultur, Department of Meteorology, Wien, Austria (jochen.wagner@boku.ac.at), (2) Division for Biomedical Physics, Innsbruck Medical University, Innsbruck, Austria, (3) Instituto di Scienze dell' Atmosfera e del Clima-CNR, Roma, Italy, (4) Earth, Atmospheric and Environmental Sciences, University of Manchester, Manchester, UK , (5) Institute for Atmospheric and Climate Science, ETH Zurich, Zurich, Switzerland

Since the discovery of anthropogenic ozone depletion more than 30 year ago, the scientific community has shown an increasing interest in UV radiation. However for photochemical reactions and various biological processes actinic flux is more important.
Therefore, three measurement campaigns had been conducted in alpine areas of Austria (Innsbruck and Hoher Sonnblick). The goal was to investigate the impact of alpine terrain in combination with snow cover on spectral actinic flux under clear sky conditions. This contribution uses the ground-based UV actinic flux measurements to evaluate two different calculation methods.
The modified (with topography) 3-D radiative transfer model GRIMALDI was used to calculate the distribution of actinic flux at the ground for selected clear sky situations. To estimate the impact of 3-D effects on actinic flux, the measurement results are also compared with the output of 1-D-model (SDISORT) runs. Apart from border problems due to periodic boundary conditions the spatial distribution of actinic flux is well reproduced by the 3-D-model. Shadowing effects and increasing actinic flux with altitude are realistically reproduced in the calculated 3-D-radiation field.