

Home

Online Library ACP

- Recent Final Revised Papers
- [Volumes and Issues](#)
- Special Issues
- Library Search
- Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper



▣ Volumes and Issues ▣ Contents of Issue 14 ▣ Special Issue

Atmos. Chem. Phys., 8, 3749–3760, 2008

www.atmos-chem-phys.net/8/3749/2008/

© Author(s) 2008. This work is distributed under the Creative Commons Attribution 3.0 License.

Personal UV exposure in high albedo alpine sites

A. M. Siani¹, G. R. Casale¹, H. Diémoz², G. Agnesod², M. G. Kimlin³, C. A. Lang³, and A. Colosimo⁴

¹Sapienza – University of Rome, Department of Physics, Rome, Italy

²ARPA Valle d'Aosta (Aosta Valley Regional Environmental Protection Agency), Saint-Christophe (Aosta), Italy

³Australian Sun and Health Research Laboratory, Queensland University of Technology, Institute of Health and Biomedical Innovation, Brisbane, Australia

⁴Sapienza – University of Rome, Department of Human Physiology and Pharmacology, Rome, Italy

Abstract. Mountain sites experience enhanced UV radiation levels due to the concurrent effects of shorter radiation path-length, low aerosol load and high reflectivity of the snow surfaces. This study was encouraged by the possibility to collect original data of personal dose on a specific anatomical site (erythemally effective UV dose on the forehead) of two groups of volunteers (ski instructors and skiers) in the mountainous areas of Italy (the Alpine site of La Thuile-Les Suches in Valle d'Aosta region). Personal doses were assessed using polysulphone dosimetry. Exposure Ratio (ER), defined as the ratio between the personal dose and the corresponding ambient dose (i.e. erythemally weighted dose received by a horizontal surface) during the same exposure period was taken into account. In addition measuring skin colours as biological markers of individual response to UV exposure, was also carried out on the forearm and cheek of each volunteer before and after exposure.

The median ER, taking into account the whole sample, is 0.60 in winter, with a range of 0.29 to 1.46, and 1.02 in spring, ranging from 0.46 to 1.72. No differences in ERs were found between skiers and instructors in spring while in winter skiers experienced lower values.

Regarding skin colorimetric parameters the main result was that both skiers and instructors had on average significantly lower values of luminance after exposure i.e. ~they became darker. It was found that the use of sunscreen and individual skin photo-type did not produce significant variations in ER across instructor/skier group by day and by seasons ($p>0.05$). It seems that sunscreen use only at the beginning of the exposure or in a few cases a couple of times during exposure (at difference with the specific instructions sheets), was not sufficient to change significantly skin colorimetric parameters across participants.

In conclusion UV personal doses on the ski-fields are often significantly higher than those on horizontal surfaces and consistently more intense respect to personal doses received by sunbathers on the beach in central Italy (ER range: 0.09–0.42). Given the high levels of exposure observed in the present study, specific public health warnings with regards to the

Search ACP

Library Search

Author Search

News

- Sister Journals AMT & GMD
- Financial Support for Authors
- Journal Impact Factor
- Public Relations & Background Information

Recent Papers

01 | ACPD, 14 Nov 2008: SCIAMACHY formaldehyde observations: constraint for isoprene emissions over Europe?

02 | ACPD, 14 Nov 2008: Observation of nitrate coatings on atmospheric mineral dust particles

03 | ACP, 14 Nov 2008: FRESCO+: an improved O₂ A-band cloud retrieval algorithm for tropospheric trace gas retrievals

04 | ACPD, 14 Nov 2008:

efficacy of sun-protection behaviours (proper application and re-application of sunscreen and protective measures such as hats and sun glasses) should be adopted.

■ [Final Revised Paper](#) (PDF, 721 KB) ■ [Discussion Paper](#) (ACPD)

Citation: Siani, A. M., Casale, G. R., Diémoz, H., Agnesod, G., Kimlin, M. G., Lang, C. A., and Colosimo, A.: Personal UV exposure in high albedo alpine sites, *Atmos. Chem. Phys.*, 8, 3749-3760, 2008. ■ [Bibtex](#) ■ [EndNote](#) ■ [Reference Manager](#)