



## Recent studies on UV radiation in Brazil

M.P. Correa (1,2), J.C. Ceballos (3), A. Moregula (4), E. Okuno (5), A. Fausto (4), A. Mol (4), and J.C. Santos (4)

(1) Service d'Aeronomie – Institut Pierre Simon Laplace – Université Pierre et Marie Curie – 4 place Jussieu, 75252, Paris, France (mpcorrea@gmail.com), (2) Instituto de Recursos Naturais – Universidade Federal de Itajubá – Av. BPS, 1303 – CEP 37500-903, Itajubá, Brazil, (3) DSA/CPTEC/INPE – Rod. Dutra, km 40 – CEP 12600-000, Cachoeira Paulista, Brazil, (4) Núcleo de Física Médica e Ambiental – Depto de Ciências Exatas e Tecnológicas – Universidade Estadual de Santa Cruz – Rodovia Ilhéus/Itabuna, km 16 – CEP 45650-000 – Ilhéus/BA, Brazil, (5) Nuclear Physics Dept. – Institute of Physics – University of São Paulo – Rua do Matão, Travessa R, 187. CEP 05508-090 Cidade Universitária – São Paulo/SP – Brazil

This presentation shows a summary of UV index measurements performed in the last years in Southeastern (SE) and Northeastern (NE) Brazilian regions. Brazil has an area of 8.5 million km<sup>2</sup> distributed between latitudes 5°N and 35°S and longitudes 5°W and 75°W. SE is the most important economic pole of South America and the NE coast is an important tourist region. This large area has a great diversity of climatic, atmospheric and geographical conditions in addition to very diverse social and cultural habits. Non-melanoma skin cancer (NMSC) is an epidemiological health problem with more than 120,000 new cases each year. The most of these cases are found in the South and Southeast regions, with about 70 new NMSC per 100,000 inhabitants.

Solar Light UV501 biometers are installed in the SE cities of São Paulo (23.6°S, 46.7°W, 865 m ASL), Itajubá/Minas Gerais (22.4°S; 45.5°W, 846 m ASL) and the NE city of Ilhéus/Bahia (14.8°S; 39.3°W; 54 m ASL). First measurements began in 2005 in São Paulo city, while Itajubá and Ilhéus have regular measurements from the beginning of 2008. Other studies related to the UV radiation modeling and interactions with atmosphere components, as ozone, aerosols and clouds, have also been performed. For example: a) UVI modelling calculations performed by a multiple-scattering spectral models; b) studies on the aerosol radiative properties based on satellite (MODIS/Terra-Aqua) and ground-based (Aeronet) observation; c) ozone content variability from satellite (OMI/Aura) and ground-based (Microtops ozonometer) measurements; d) behavioral profile of the population, as regarding habits of solar exposure and sun protection measures.

Results show that more than 75% of the measurements conducted in the summer (outside noon) can be classified as upper than high UVI according to World Health Organization (WHO) recommended categories: Low (UVI < 2), Medium ( $3 \leq \text{UVI} < 6$ ), High ( $6 \leq \text{UVI} < 8$ ), Very High ( $8 \leq \text{UVI} < 11$ ) and Extreme (UVI  $\geq 11$ ). Under clear-sky conditions it has been constantly high in all the Brazilian territories. Maximum UVI recorded: São Paulo (2005-2008): 17.2; Itajubá: 15.5; and Ilhéus: 13.6. Even during winter, measurements constantly reach values around UVI = 6. São Paulo is appreciably touched for these high UV radiation levels to have a population very exposed during its quotidian. In the popular culture, an urban site is not popularly considered as a sunny place. In other words, for a large part of the Brazilian population, São Paulo or Itajubá are perceived as places where the risk to the sun overexposure is relatively low. These recent results are being used as basis for educational programs to teach the population about precautions to be taken during sun exposure.

Acknowledgments: This study was supported by FAPEMIG (Minas Gerais, Brazil), FAPESP (São Paulo, Brazil) and CNPq (Brasília, Brazil).