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1 Relationships between cloud-induced UVB and solar radiation attenuation

M.P. Correa (1), J.C. Ceballos (1), M.J. Bottino (1), G. Coronel (2).

(1) DSA / CPTEC / INPE, Rod. Pres. Dutra, km 40, 12630-000, Brazil, (2) LIAPA/Universidad Nacional de Asuncion. (mpcorrea@cptec.inpe.br / Fax: (55) 12 3186-9291).

In this work we analyze the hourly and seasonal variations of the measured UVB and total radiation in order to assess: a) the cloud condition influence on each of them; b) the relationship between their attenuations and c) a preliminary evaluation of empirical patterns relating UVB fluxes and cloudiness in the region. The analysis was based on comparisons between measurements, theoretical calculations and cloud classification provided by satellite imagery. a) Broadband UVB (280–320 nm) and total (300–3000 nm) radiation measurements were performed in Asunción (Paraguay) and São Paulo (Brazil) cities. Asunción measurements have been carried out between 2000 and 2002 and São Paulo measurements were obtained by recently installed sensors. b) UV Global Atmospheric Model (UVGAME) provides UV theoretical clear-sky calculations. UVGAME is a multiple-scattering radiative transfer code for applications under different atmospheric, temporal and geographical conditions (1). Total irradiance calculations were provided by GL 1.2 algorithm, a simplified model for assessment of clear-sky solar irradiance at ground level (2). And, c) a clustering method applied to GOES-8 imagery allows for identification of different types of clouds. This method is based on full resolution images in visible and infrared channels. Reflectance, brightness temperature and their textures are used for determining 30 different classes of pixel environment. Hierarchical clustering of these centroids suggests the existence of five main groups of scenes (surface, cumulus, cirrus, stratus and deep convective multi-layered clouds) (3). The discussion involving both UV and solar radiation suggests a functional relationship between them under clear-sky and overcast local condi-

tions. Relationship in fair weather cumulus conditions requires further analysis. Cloud classification in satellite imagery can provide useful information about the cloud cover and its characteristics.

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