



Vitamin D synthesis by using a multiband filter radiometer in Río Gallegos, Argentina

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The vitamin D synthesis is very important in the human health. It is affected by UVB solar radiation. Therefore, its effect is strongly dependent of the stratospheric ozone amount, which undergoes large variations in the Río Gallegos city due to ozone hole passage and its influence on these sub-polar latitudes. In this paper is presented the method to obtain vitamin D synthesis by using a multiband filter radiometer. Comparing data modeled with ultraviolet radiation measurements made by a multiband filter radiometer GUV-541 have been achieve to obtain vitamin D synthesis in the OAPA ($51^{\circ} 33' S$, $69^{\circ} 19' W$), Río Gallegos, southern of Argentina. The methodology used to obtain the vitamin D synthesis combines irradiance measurements of a multiband filter radiometer with data modeled (output of radiative transfer model). The data models are weighted with action spectra published by the CIE (International Commission on Illumination) which describes the relative effectiveness of different wavelengths in the generation of a particular biological response. This value was validated with the vitamin D synthesis derived from measurements taken with a Brewer spectrophotometer (SN 124) belonging to INPE (Instituto Nacional de Pesquisas Espaciais, Brazil) which is able to measure solar spectra between 290 to 325nm. This procedure increases the instrumental capabilities of the multiband filter radiometer. Moreover, it is evaluated the annual variation of vitamin D synthesis dose through exposure to ultraviolet radiation. These values would be lower than the recommended values for most of the year for these latitudes.