



Study of cloud enhanced surface UV radiation at Atmospheric Observatory of Southern Patagonia, Río Gallegos, Argentina

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The ozone and ultraviolet (UV) radiation are two important issues in the study of Earth atmosphere. The anthropogenic perturbation on ozone layer has induced change in the amount of UV radiation that reaches the Earth's surface, mainly through the Antarctic ozone hole. Also clouds have been identified as the main modulator of UV amount in short time scales. While clouds can decrease direct radiation, they can produce an increase in the diffuse component, and as consequence the surface UV radiation may be higher than an equivalent clear sky scenario. In particular this situation can be important when low ozone column and partially cloud cover skies happen simultaneously. These situations happen frequently in southern Patagonia, where the CEILAP Lidar Division has established the Atmospheric Observatory of Southern Patagonia, an atmospheric remote sensing site near the city of Río Gallegos (51°55'S, 69°14'W). In this paper, the impact of clouds over the UV radiation is investigated by the use of ground based measurements from the passive remote sensing instruments operatives in this site, mainly of broad and moderate narrow band filter radiometers. Cloud modification factors (CMF, ratio between the measured UV radiation in a cloudy sky and the simulated radiation under cloud-free conditions) are evaluated for the study site. CMF higher than 1 are found during spring and summer time, when lower total ozone columns, higher solar elevations and high cloud cover occur simultaneously, producing extreme erythema irradiance at ground surface.