



The uv-b radiation at southern Brazil and its damage on the human health: meteorological parameters influence

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The temperature and humidity can intensify the UV-B damage effects on the humans especially in terms of the carcinogenesis and immune deficiency. It is estimated that for temperatures above 23°C, an increase of only 1°C can causes an increase of about 5% on UV carcinogenesis effect. In terms of humidity, an increase of 10% reflects an increase about 4% on UV-B damages. Since the first measurements in 1998 at the Southern Space Observatory (29.4°S, 53.8°W), south of Brazil, the temperature remains above 23°C from October to April ($26.5 \pm 2.1^\circ\text{C}$) meeting maximum values on January ($29 \pm 1^\circ\text{C}$). For this period, the relative humidity is about $80 \pm 4.6\%$, with the minimum in December ($73.5 \pm 5.8\%$). Therefore, on this region, almost half year can be expected a significant additive contribution on the UV-B damage effects of about 50%, considering the temperature means 3.5°C above 23°C from October to April, that is 18% (5% of additive damage to each 1°C variation) \times 3.5°C), which should be added to the relative humidity contribution of about 32% (4% of additive damage to each 10% humidity changes) \times 8). This contribution can be underestimated considering the trends of the pluviometry observed recently, which for the period of 2004 to 2007 a significant negative variation of about $-20 \pm 40\%$ has been reported. This reduction on pluviometry causes an increase in UV solar radiation and temperature. Therefore, to understand the real effects of the UV-B radiation it is also necessary to correlate the influences of extrinsic factors as the climatic action and its effects on the human health.