



## **Effects of high latitude dust on snow UV albedo and solar UV irradiance measured at Marambio during 2013-2017 with comparison to simulated UV irradiances**

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The polar regions of the Earth are characterized with low solar elevation angles, cold temperatures and large amount of snow and ice. Under the harsh polar conditions, good quality in situ measurements of incoming and outgoing solar radiation, and surface albedo, is a major challenge. In the Antarctic, the solar radiation at the wavelengths of ultraviolet (UV) has been of particular interest due to the polar stratospheric ozone depletion, which increases UV radiation on the ground. In the presence of light absorbing impurities (soot, dust, organic carbon) on snow, albedo can be most affected at the wavelengths of UV.

Here we utilize for the first time our Finnish-Argentinian co-operative Marambio UV irradiance SL501 data measured during 2013-2017, together with our Marambio ozone soundings, to analyze effects of local high latitude dust on measured snow UV albedo and solar UV irradiance and on differences in simulated UV irradiances. We also discuss our measurement design, instrumentation and data system, calibration assessment, as well as challenges, for measuring the incoming and outgoing UV radiation (from which snow albedo is calculated) at the Marambio Antarctic Research Station (64°S), member of the Global Atmosphere Watch GAW programme of the World Meteorological Organization WMO. The station has personnel available year-round, and our approach includes snow surface photos taken on a regular basis as ancillary data source for the albedo data usability.