

SOLAR UV NETWORK IN ANTARCTICA

K. Masson*, T. Koskela, P. Taalas
Finnish Meteorological Institute

E. Cuevas*, D. M. de la Cruz González, A. Redondas Marero
Instituto Nacional de Meteorología, Spain

* kaisa.masson@fmi.fi, ecuevas@inm.es

Cooperation between:

- INM Instituto Nacional de Meteorología (Spain)
- FMI Finnish Meteorological Institute
- CADIC Centro Austral de Investigaciones Científicas (Argentina)
- DNA-IAA Dirección Nacional del Antártico-Instituto Antártico Argentino

General goals

- Promote observations and research of stratospheric ozone, UV radiation and related physical parameters in the Antarctic region.
- Determine the variations in ozone concentration, spectral UV radiation and photosynthetic active radiation.
- Improve the knowledge of the meteorological and chemical mechanisms that determine the Antarctic atmosphere throughout the winter and its features in summer.
- INM: Quality control of the network. Official data delivery to the international scientific community as part of the national project RACRUV (Red Antrtica para la vigilancia y Caracterizacin de la Radiacin UltraVioleta).
- FMI: Quality assurance of the network.

First calibration

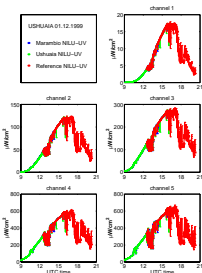
The instruments of Marambio and Ushuaia stations where calibrated together with the Travelling reference against the SUV-100 spectroradiometer in Ushuaia in December 1999.

- Calibration coefficients were calculated as follows:

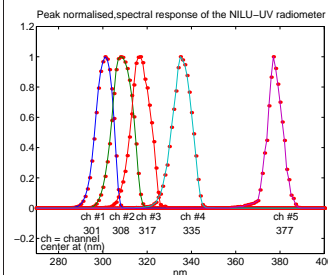
$$\text{calibration coefficient} = \frac{\int_{270}^{400} I(\lambda) * E(\lambda)}{RAW} \quad (1)$$

where I is the spectral irradiance measured by the spectroradiometer, E the spectral response of the NILU-UV channel and RAW the raw counts of the NILU-UV.

First calibration



Spectral responses of the NILU-UV channels

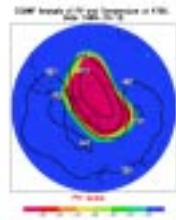


Stations

Belgrano II: 77°52'S 34°37'W

Marambio: 64°14'S 56°37'W

Ushuaia: 54°48'S 68°19'W



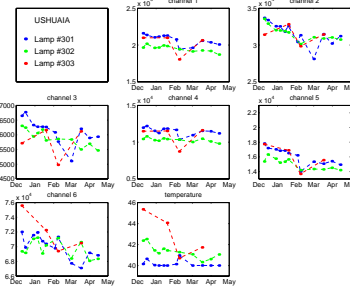
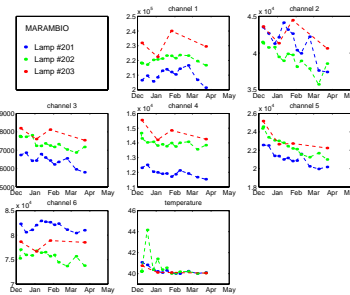
INSTRUMENTS

NILU-UV multichannel radiometer

- 5 channels measuring UV radiation
- center wavelengths at around: 302 nm, 312 nm, 320 nm, 340 nm, 380 nm
- bandwidths around 10 nm at FWHM
- 1 channel for photosynthetic active radiation (PAR): 400–700 nm

Stability control

The stability of the radiometer is recorded weekly using lamp measurements. Following figures show the time series of the lamp measurements of the instruments located in Belgrano, Ushuaia, Marambio and the travelling reference.



Quality control

A travelling reference radiometer has been provided in order to transfer the irradiance absolute scale from the reference spectroradiometer to the stations. For that purpose solar comparisons are performed between the station radiometer and the travelling reference radiometer.

Solar comparisons

Solar comparisons have been performed for the radiometers of Marambio and Ushuaia. The relative differences compared to the travelling reference are shown in the following figures.

