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Results from the PMOD/WRC-COST726 broadband intercomparison campaign

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The Physikalisch Meteorologische Observatorium Davos, World Radiation Center (PMOD/WRC) operates the European Reference Centre for solar Ultraviolet (UV) Radiation under a cooperation agreement with the Joint Research Centre of the European Commission in Ispra, Italy. It consists of laboratory infrastructure for characterising UV filter radiometers (essentially their angular and spectral response) and of the transportable reference spectroradiometer QASUME. The absolute calibration of a characterised broadband radiometer is obtained by simultaneous solar irradiance measurements relative to the transportable reference spectroradiometer QASUME, which represents the European irradiance reference for spectral solar UV irradiance.

Working group four of the COST Action 726 "Long term changes and climatology of UV radiation over Europe" is responsible for the Quality control of erythemally weighted solar irradiance radiometers. One major task of this activity was the organisation of a characterisation and calibration campaign of reference radiometers in use in regional and national UV networks in Europe. The long-term aim is to homogenise broadband radiometer measurements on a European scale in view of providing a consistent platform for solar UV measurements in Europe.

The campaign was organised at the PMOD/WRC from 30 July to 25 August 2006, which is located in the Swiss Alps at 1610 m a.s.l.. A total of 36 Radiometers from 16 countries participated at the campaign, including one radiometer from the Central UV Calibration Facility, NOAA, U.S.A; 9 Yankee UVB-1, 5 Kipp & Zonen, 2 Scintec,

10 analog and 8 digital Solar Light Ver. 501, 1 Eldonet and 1 SRMS (modified Solar Light Ver. 501). A second spectroradiometer from the Medical University of Innsbruck participated as well to provide redundant global spectral solar UV irradiance measurements. This spectroradiometer agreed with the QASUME spectroradiometer to within +-2% over the two week measurement campaign. The atmospheric conditions during the campaign varied between fully overcast to clear skies and allowed a reliable calibration for the majority of instruments. A novel calibration methodology using the spectral as well as the angular response functions measured in the laboratory provided remarkable agreement with the reference spectroradiometer, with expanded uncertainties (k=2) of about 7% for most instruments.