NOAA Global Radiation Group Participation in International Comparisons Offering Traceable Calibration to World Solar Radiation Standards

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The ESRL/GMD Global Radiation Group (G-Rad) strives to collect high-quality data of the Earth's surface and atmospheric radiation budgets. Data collection requires accurate calibration of field instruments that are traceable to international standards. The G-Rad group regularly participates in international comparisons in order to calibrate our standard instruments against the accepted world standards. With our standards, we are able to perform calibrations of broadband shortwave and longwave sensors as well as broadband ultraviolet (UV) and narrowband filter radiometers.

In 2015, we participated in the Twelfth World Meteorological Organization (WMO) International Pyrheliometer Comparison (IPC-XII) hosted at the Physikalisch-Meteorologisches Observatorium Davos (PMOD). Comparing our standard active cavity pyrheliometers to the World Radiations Reference (WRR) allows us to obtain a new scale factor for our standards, which we use to perform traceable calibrations for our field instruments. We also attend the annual National Renewable Energy Laboratory (NREL) National Pyrheliometer Comparison (NPC) to check that our WRR correction factor has not changed since the last IPC.

In 2015 G-Rad also participated in the Fourth WMO Filter Radiometer Comparison (FRC) hosted by PMOD. Similar to the IPC, the FRC allows instruments to be compared to the World Optical Depth Research and Calibration Centre (WORCC) reference group for aerosol optical depth. Participation in this comparison provides us with traceable field instruments that can be used for air quality and climate studies.

In 2017, as a WMO regional UV calibration center, G-Rad sent a UV broadband instrument to participate in the second International UV Filter Radiometer Comparison (UVC), hosted at PMOD, in order to obtain traceable calibrations against the standards at the World Calibrations Center for UV (WCCUV).

The G-Rad group is committed to maintaining a high standard for calibration of our instrumentation. We will continue our participation in these inter-comparisons as well as introducing new experiments to further our understanding of the calibration process. Two such experiments that G-Rad led in 2018 are outlined here.

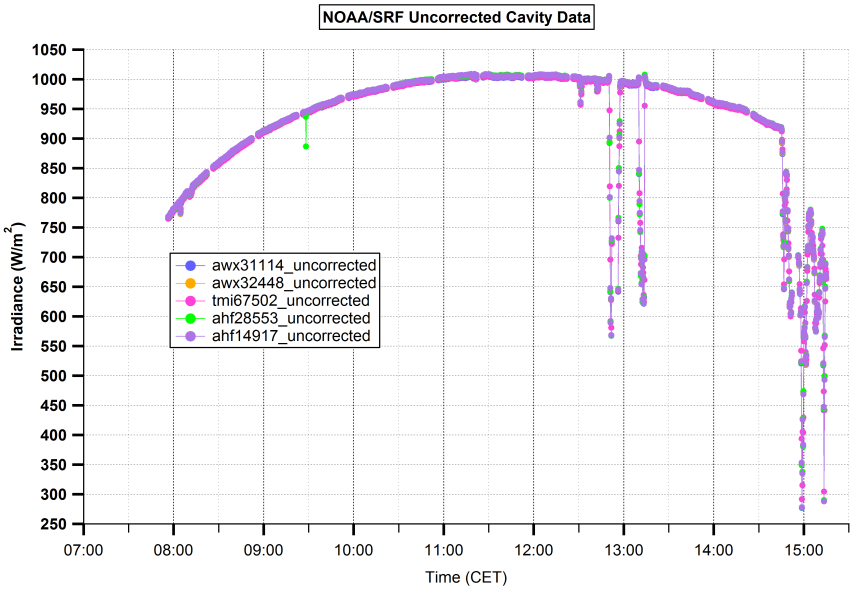

Figure 1. Irradiance data collected from the G-Rad standard cavity group during a mostly clear day at the 2015 WMO International Pyrheliometer Comparison (IPC-XII).