Introduction

The Global Radiation Group (G-Rad) of NOAA’s Global Monitoring Division (GMD) strives to collect high quality radiation data at the Earth’s surface, including climate quality surface radiation budget data. High quality data collection requires accurate calibrations of field instruments that are traceable to international standards. NOAA G-Rad participated in the following World Meteorological Organization (WMO) calibration 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 both for our network instruments and as a service to other collaborators.

Twelfth WMO International Pyrheliometer Comparison (IPC-XII), PMOD, Davos, Switzerland, 2015

NOAA G-Rad maintains a group of active-cavity pyrheliometers that serve as the standards for the WMO Regional Radiation Center, Region IV. These cavities are used to perform calibrations for field instruments. Regular participation at the WMO IPC, held every five years, allows us to obtain new scale factors traceable to the World Radiation Reference (WRR).

- Participation from 33 countries with 134 pyrheliometers.
- NOAA attended with six Active Cavity Pyrheliometers.
- Data from nine days used to transfer WRR to NOAA standards.

Annual National Renewable Energy Laboratory (NREL) National Pyrheliometer Comparison (NPC), 2017

The annual NREL National Pyrheliometer Comparison (NPC) allows us to check that our WRR scale factor has not changed since the last IPC. The NOAA standard group serves as the regional transfer standard for the instruments that participate at the NPC.

- 75 UV filter radiometers from 37 countries
- Sensors are assigned an absolute calibration (C) factor as well as spectral and angular responsivity functions (SRF and ARF).

Second International UV Filter Radiometer Comparison (UVC), PMOD, Davos, Switzerland, 2017

Participation in the second International UV Filter Radiometer Comparison (UVC), held every five years, allows us to obtain calibrations traceable to the standard instruments at the World Calibration Center for UV (WCCUV).

- SRF converts from detector weighted irradiance to erythemal weighted irradiance.
- ARF corrects for cosine error affecting the detector.

Conclusion

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.

References


https://doi.org/10.5194/acp-17-4155-2017.