

Contributors

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Research Highlight

Measurements of diffuse solar radiation (the total horizontal flux minus the solar beam flux) are crucial for validating radiative transfer codes used in climate models. Yet, there is no international standard for diffuse solar flux. There is only an international standard for the solar beam, which uses a group of absolute cavity radiometers kept in Davos, Switzerland. Diffuse radiation, or "skylight", consists of sunlight scattered by molecules and cloud and aerosol particles in the sky and is much more difficult to calculate than the solar beam.

As shown in the photo, pyranometers (instruments for measuring solar radiation flux) located at the Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) Southern Great Plains (SGP) site have black balls on long arms that continuously block the solar beam in order to measure only diffuse flux. For ten days in October 2006, the ACRF SGP site hosted four excellent pyranometers that were candidates for an international working standard for diffuse flux, designed to serve both the ARM and the larger baseline Surface Radiation Network communities.

Reference(s)

Michalsky, J. J., C. Gueymard, P. Kiedron, L. J. B. McArthur, R. Philipona, and T. Stoffel, 2007: A proposed working standard for the measurement of diffuse horizontal shortwave irradiance, *J. Geophys. Res.*, 112, D16112, doi:10.1029/2007JD008651.

Working Group(s)

Radiative Processes



The three pyranometers proposed for the international standard for diffuse flux are shown here in action during the 2006 campaign at the ACRF SGP site. Of note are the shadows of the blocking balls on the domes of each pyranometer. The blocking balls are moved by a solar tracker to continuously shade the pyranometers.