

The IR loss in diffuse measurements made by thermopile pyranometers is examined. Diffuse measurements are used for the study of IR losses because diffuse irradiance is much smaller than the total irradiance and hence the IR effects can be more clearly seen. Specifically, diffuse measurements of an Eppley PSP pyranometer are compared to those made with a Schenk Star pyranometer. Pyranometers with black and white or star type junctions suffer minimal IR loss because the reference and receiving junctions of the thermopile are at the same thermal level. The difference between diffuse values can be attributed to calibration and cosine response errors as well as IR loss. This is a preliminary study over one month when pyrgeometer data are available. Examination of the differences at various times of the year and at more than one location is necessary to generalize the findings in this report. Several methods of correcting for IR loss are examined. First subtracting out the average nighttime offset during the day is tested. Next an extrapolation between early morning and late evening offsets is tested. This should help eliminate the IR offset in both the morning and evening hours, but underestimate the IR losses during the rest of the day. Next, correlations of IR losses calculated using pyrgeometer measurements with temperature, relative humidity, and irradiance are evaluated. Initial results show that it should be possible to use more commonly available measurements rather than pyrgeometer data to estimate IR loss for Eppley PSP pyranometers.