



Independent field test of the solar monitoring system RaZON+

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We present a 1.5 year independent field test of the RaZON+, the unique Kipp en Zonen solar monitoring system for accurate and cost effective solar measurements. The system uses the PH1 fast pyrheliometer and the shaded PR1 fast pyranometer to measure direct normal irradiance (DNI) and diffuse horizontal irradiance (DHI). From these measurements, RaZON+ calculates the global horizontal irradiance (GHI). Calculation of the GHI and measurement of the DHI instead of the other way around minimizes the uncertainty due to the directional response of the pyranometer.

Measurements over a time period of 1.5 years that are publicly accessible from the independent measurement facility of NREL in Golden, Colorado, USA have been used. We have analysed the measurement data and compared it with multiple CHP1 pyrheliometers for DNI and CMP22 pyranometers for GHI and DHI. A comparison with the SPN1, present at NREL will also be shown.

The PH1 pyrheliometer is a new concept pyrheliometer with inherent low fouling sensitivity. A comparison of the regularly cleaned CHP1 and the non-cleaned PH1 shows a minimal influence of fouling on the PH1. Furthermore, we also determined the angular response of the PH1 pyrheliometer, both with a laboratory measurement as well as an outdoor measurement. A comparison is made with the theoretical angular response.

The system as a whole has connectivity through a wired connection, either Ethernet or a two wire RS485 connection, and a Wi-Fi connection. Monitoring data can be accessed in real-time on an interactive and on-board webpage as well as through the download of data files.