



Validation of gridded data sets of the surface radiation budget with non-BSRN surface observations

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Gridded data sets of the different components of the surface radiation budget derived from satellite observations and from reanalysis data sets become increasingly available to the scientific community. In all gridded data sets fundamental assumptions are required to determine the surface radiation at each grid box. Hence, validation of these gridded data sets with high-quality reference surface radiation measurements is mandatory.

The measurements obtained within the global Baseline Surface Radiation Network (BSRN) are typically used as reference for the validation of gridded data sets. Unfortunately, wide areas of the globe remain uncovered by BSRN surface sites. This includes large parts of northern Eurasia, Africa, and the oceans. In these regions, commonly no validation of gridded data sets is conducted and differences between the data sets can not be interpreted.

Here, we present validation results of gridded data sets of the downwelling shortwave and longwave radiation derived from satellite (CM SAF, GEWEX) and reanalysis (ERA-Interim) using surface stations that are not included in the BSRN archive. These surface observations include measurements obtained in Western Africa and in Namibia as well as Atlantic and Pacific buoy observations. We compare the quality of the gridded data sets at the additional surface sites with the data set quality derived by validation at the BSRN sites. Special attention is given to the temporal homogeneity of the time series.