EMS Annual Meeting Abstracts
Vol. 12, EMS2015-288, 2015
15th EMS / 12th ECAM

Validation of CM SAF surface solar radiation datasets over Finland and Sweden

Aku Riihela (1), Thomas Carlund (2), Joerg Trentmann (3), Richard Mueller (3), and Anders Lindfors (1)

(1) Finnish Meteorological Institute, Finland (anders.lindfors@fmi.fi), (2) Swedish Meteorological and Hydrological Institute, SE-601 76 Norrköping, Sweden, (3) Deutscher Wetterdienst, 63067 Offenbach, Germany

Accurate determination of the amount of incoming solar radiation at Earth's surface is important for both climate studies and solar power applications. Satellite-based datasets of solar radiation offer wide spatial and temporal coverage, but careful validation of their quality is a necessary prerequisite for reliable utilization. Here we study the retrieval quality of one polar-orbiting satellite-based dataset (CLARA-A1) and one geostationary satellite-based dataset (SARAH), using in situ observations of solar radiation from the Finnish and Swedish meteorological measurement networks as reference. Our focus is on determining dataset quality over high latitudes and evaluating also daily mean retrievals, both of which are aspects that have drawn little focus in previous studies. We find that both datasets are generally well capable of retrieving the levels and seasonal cycles of solar radiation in Finland and Sweden, with some limitations. SARAH exhibits a slight negative bias and increased retrieval uncertainty near the coverage edge, but in turn offers better precision (less scatter) in the daily mean retrievals owing to the high sampling rate of geostationary imaging.