

EGU22-5605

<https://doi.org/10.5194/egusphere-egu22-5605>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Quality Assessment of SARA3: The new regional satellite-based Surface Solar Radiation data set from the CM SAF

**Jörg Trentmann**, Uwe Pfeifroth, Jaqueline Drücke, and Roswitha Cremer

Deutscher Wetterdienst (DWD), Offenbach, Germany (joerg.trentmann@dwd.de)

The incoming surface solar radiation has been defined as an essential climate variable by GCOS. Long term monitoring of this part of the earth's energy budget is required to gain insights on the state and variability of the climate system. In addition, climate data sets of surface solar radiation have received increased attention over the recent years as an important source of information for solar energy assessments, for crop modeling, and for the validation of climate and weather models.

The EUMETSAT Satellite Application Facility on Climate Monitoring (CM SAF) is deriving climate data records (CDRs) from geostationary and polar-orbiting satellite instruments. Within the CM SAF these CDRs are accompanied by operational data at a short time latency to be used for climate monitoring. All data from the CM SAF are freely available via [www.cmsaf.eu](http://www.cmsaf.eu).

Here we present the new edition of the SARA3 climate data record of surface solar radiation from the CM SAF. The regional SARA3 climate data record (Surface Solar Radiation Dataset – Heliosat) is based on observations from the series of Meteosat satellites. SARA3 provides high-resolution data (temporal and spatial) of the surface solar radiation (global and direct) and the sunshine duration from 1983 to 2020 for the full view of the Meteosat satellite (i.e., Europe, Africa, parts of South America, and the Atlantic ocean). For the first time, this edition of the SARA3 data record also provides user-oriented data of spectral radiation, namely the photosynthetic active radiation (PAR) and the daylight (DAL); UV radiation parameters are also available upon request.

In this contribution we introduce the results from the comparison of the satellite-derived surface radiation with available surface measurements; the evaluation addresses the accuracy and the temporal stability of the satellite data using data from regional and global networks, e.g., BSRN, GEBA, ECA&D, CLIMAT, as well as, in the case of PAR and DAL, from individual stations. We present the improvements of the edition 3 of the SARA3 data record compared to previous editions, in particular over snow-covered surfaces. The high accuracy and stability of these data records allow the assessment of the spatial and temporal variability and trends.