

DATASET DESCRIPTION

Gridded (1 km) monthly data of surface irradiance and sunshine duration based on surface measurements and satellite observations - DUETT

Version: V001

Publication date: 2026

Cite data set as:	Gridded (1 km) monthly data of surface irradiance and sunshine duration based on surface measurements and satellite observations - DUETT, Version V001
Dataset-ID:	urn:wmo:md:de-dwd-cdc:d084f40d-d76b-4e3b-8d23-91aac546d7a0
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/grids_germany/monthly/duett/radiation_global/recent
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/grids_germany/monthly/duett/sunshine_duration/recent
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/grids_germany/hourly/duett/DUETT_ListOfStations.csv

ABSTRACT

These monthly data are based on hourly data generated by combining satellite and ground-based observations of global radiation and sunshine duration. The calculation of the monthly sums is based on the average monthly hourly sums, which are calculated from the hourly data. Raster data for global radiation and sunshine duration are generated and made available in the EPSG:3035 projection for Germany with a spatial resolution of 1 km. The dataset is divided into a regularly updated section in the directory `./{parameter}/recent/` and an archive of older data in the directory `./{parameter}/historical/`.

POINT OF CONTACT

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DATASET DESCRIPTION

Parameter	global radiation, sunshine duration
Temporal coverage	2026-01-01 -- ...
Temporal resolution	1 month
Spatial coverage	Germany
Projection	ETRS89 / LAEA Europe (EPSG:3035)
Format description	recent monthly surface downwelling shortwave radiation : The folder <code>.radiation_global/recent/</code> contains recent monthly gridded data files in netcdf-format. The naming of the files follows: <code>{parameter}_duett_1km_DE_month_{YYYYmmddHHMM}.nc</code>
Format description	recent monthly sunshine duration (SDU) : The folder <code>.sunshine_duration/recent/</code> contains monthly gridded data in netcdf format. The naming convention of the netcdf-files is: <code>{parameter}_duett_1km_DE_month_{YYYYmmddHHMM}.nc</code>
Format description	List of stations : Liste der Stationen mit Insitu-Messungen, welche zur Erzeugung des Rasterproduktes verwendet werden.

DATA ORIGIN

These monthly raster data are based on hourly raster data, which are based on satellite observations and ground measurements (data set ID: urn:wmo:md:de-dwd-cdc:5ffce5ae-3b32-4e43-9457-374c1bce6204).

RESOURCE MAINTENANCE

In the directory `./recent/` the data files are monthly updated.

In the directories `./{parameter}/historical/` the data files are updated annually.

UNCERTAINTIES

The focus of these products is on providing spatially high-resolution, monthly data. The software for generating hourly raster data is constantly being improved and updated, which can lead to minor discontinuities when examining long time series. In areas with heterogeneous cloud cover, particularly in mountainous regions, these raster data may occasionally differ from measurements at nearby stations. This is due to the different spatial representativeness of the two measurement methods. In cases of clear skies and snow cover, there is a potential underestimation of solar radiation and sunshine duration in the raster data, as snow-covered ground and clouds are difficult to distinguish from the satellite.

CONSIDERATIONS FOR APPLICATIONS

The data represent the spatially averaged value for the specified grid area.

ADDITIONAL INFORMATION

The gridded data are obtained from ground measurements and satellite data using a geo-statistical method. This method is subject to continuous further development; a temporal homogeneity of the data cannot be guaranteed. Changes in the method used are indicated in the file name. A complete check of the data does not take place; we are grateful for information on problematic data points in the raster data (see Contact).

LITERATURE

[Brinckmann et al., EMS 2022: Combination of satellite and ground measurements of hourly surface solar radiation data in Germany](#)

[Klameth et al., 2022: Towards the combination of in-situ and satellite-based solar radiation data in near-realtime – the project DUETT at DWD](#)

[Pfeifroth et al., 2026. An overview of surface solar radiation data products at the German meteorological service](#)

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REVISION HISTORY

This document is maintained by Deutscher Wetterdienst, CMSAF - Satelliten-gestütztes Klimamonitoring, last edited at 2026-07-28.