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Trends and variability of surface solar radiation in Europe based on CMSAF satellite data sets

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The EUMETSAT Satellite Application Facility on Climate Monitoring (CM SAF) generates satellite-based, high-quality climate data records, with a focus on the global energy and water cycle.
Here, the CMSAF's latest data sets of surface solar radation, Surface Solar Radiation Data Set - Heliosat (SARAH), and CM SAF cLouds, Albedo and Radiation dataset from AVHRR data (CLARA), are analyzed and validated with reference to ground-based measurements given by the Baseline Surface Radiation Network (BSRN), the Global Energy Balance Archive (GEBA) and other sources.
Both, the new CMSAF SARAH and CLARA surface solar radiation data sets show a high accuracy and stability during the last 3 decades. The conducted trend analysis for Europe reveals the spatial pattern of the overall brightening from the 1980s onwards, including decadal variability. The trends and variability of surface solar radiation reasonably agree between the CMSAF satellite data sets and the ground measurements.