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Trends and variability of cloud and radiation parameters based on CM SAF's latest satellite climate data records

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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 Earth's energy balance and water cycle. Here, multiple of these data records are used to assess their consistency in trends and variability. This multi-parameter analysis covers at least the time period of 1992-2015 and includes satellite-based data records and station measurements. This study focuses on Europe, but results for other regions like Africa and the Atlantic Ocean will be presented as well. The climate data records of surface solar radiation, top-of-atmosphere radiation and cloud fraction are analyzed in a common framework to check the consistency of spatial trends among the different data records and parameters.

It will be shown that there is an overall agreement between trends in surface solar and top-of-atmosphere radiation and cloud cover in Europe, where a brightening is observed since the 1980's. Some discrepancies are revealed over the Atlantic Ocean.

This contribution will give new insights on the quality and consistency of CM SAF's climate data records. In addition, it will provide an observation-based spatial view on important climate-related atmospheric processes such as cloud radiative effects. The role of aerosols is discussed, too.