



## **MVIRI/SEVIRI TOA Radiation Datasets within the Climate Monitoring SAF**

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Within CM SAF, Interim Climate Data Records (ICDR) of Top-Of-Atmosphere (TOA) radiation products from the Geostationary Earth Radiation Budget (GERB) instruments on the Meteosat Second Generation (MSG) satellites have been released in 2013. These datasets (referred to as CM-113 and CM-115, resp. for shortwave (SW) and longwave (LW) radiation) are based on the instantaneous TOA fluxes from the GERB Edition-1 dataset. They cover the time period 2004-2011. Extending these datasets backward in the past is not possible as no GERB instruments were available on the Meteosat First Generation (MFG) satellites.

As an alternative, it is proposed to rely on the Meteosat Visible and InfraRed Imager (MVIRI - from 1982 until 2004) and the Spinning Enhanced Visible and Infrared Imager (SEVIRI - from 2004 onward) to generate a long Thematic Climate Data Record (TCDR) from Meteosat instruments. Combining MVIRI and SEVIRI allows an unprecedented temporal (30 minutes / 15 minutes) and spatial (2.5 km / 3 km) resolution compared to the Clouds and the Earth's Radiant Energy System (CERES) products. This is a step forward as it helps to increase the knowledge of the diurnal cycle and the small-scale spatial variations of radiation.

The MVIRI/SEVIRI datasets (referred to as CM-23311 and CM-23341, resp. for SW and LW radiation) will provide daily and monthly averaged TOA Reflected Solar (TRS) and Emitted Thermal (TET) radiation in "all-sky" conditions (no clear-sky conditions for this first version of the datasets), as well as monthly averaged of the hourly integrated values. The SEVIRI Solar Channels Calibration (SSCC) and the operational calibration have been used resp. for the SW and LW channels. For MFG, it is foreseen to replace the latter by the EU-METSAT/GSICS recalibration of MVIRI using HIRS. The CERES TRMM angular dependency models have been used to compute TRS fluxes while theoretical models have been used for TET fluxes. The CM-23311 and CM-23341 datasets will cover a 32 years time period, from 1st February 1982 to 31st January 2014. TRS and TET fluxes will be provided on a regular latitude-longitude grid at a spatial resolution of  $0.05^\circ$  (i.e. about 5.5 km) to ensure consistency with other CM SAF products. Validation will be performed at lower resolution (e.g.  $1^\circ \times 1^\circ$ ) by intercomparison with several other datasets (CERES EBAF, CERES SYN 1deg-day, HIRS OLR, ISCCP-FD, NCDC daily OLR, etc.).