Inter-calibration of Meteosat First Generation IR measurements using HIRS data

<u>Joerg Schulz</u>[†]; Tim Hewison; Bertrand Theodore [†]EUMETSAT, Germany Leading author: <u>joerg.schulz@eumetsat.int</u>

The detection of climate change and analysis of climate variability at interannual scales requires well calibrated observations and long-term homogeneity of time series of data. Observations from EUMETSAT's series of Meteosat First and Second Generation geostationary satellites spans a period from 1982 to today for the zero degree longitude sub-satellite position and from 1997 over the Indian Ocean providing data for climate analysis at multidecadal scale. However, heterogeneities in the time series are introduced due to successive radiometers having different filter functions and due to changes in calibration methodology over time. This paper presents the methodology and first results of an effort to inter-calibrate the complete time series of the Meteosat First and Second Generation radiometers MVIRI and SEVIRI IR channels (6.3 and 11.8 lm) to an inter-calibrated time series of clear-sky HIRS observations provided by NOAA. The methodology is based on the collocation of individual observations from the HIRS and MVIRI/SEVIRI instruments and follows the methodology used to inter-calibrate the SEVIRI instrument with IASI as already demonstrated within the GSICS initiative. Major problems to overcome are uncertainties introduced by the different spectral channels of MVIRI and HIRS, different filter functions of the MVIRI/SEVIRI instrument series, currently unknown uncertainties in the HIRS inter-calibration, and different cloud detection performances of MVIRI and SEVIRI. The activity is performed in the frame of EUMETSAT's Climate Data Record generation activities and will be introduced as the first GSICS activity that targets at the inter-calibration of a climate-relevant series of weather satellite observations.