Characterizing cloud properties and processes using CM SAF satellite datasets

M. Stengel (1), K.-G. Karlsson (2), J.F. Meirink (3), and R. Hollmann (1)

(1) Deutscher Wetterdienst, Germany (martin.stengel@dwd.de), (2) Sveriges Meteorologiska och Hydrologiska Institut (Karl-Goran.Karlsson@smhi.se), (3) Koninklijk Nederlands Meteorologisch Instituut (meirink@knmi.nl)

The climatological characterization of clouds, their properties and associated processes require both atmospheric models and observational datasets. The observations can for example serve as reference for model tuning, as contributor to the analysis of the initial atmospheric state, as boundary constraints during the modelled evolution of the atmosphere, and as constraints for developments of model physics. They can further be used to analyse the long-term state of clouds and their spatial and temporal variability.

On global scales, satellites observations with their spatial and temporal coverage are uniquely suited for such applications. However, the satellite observations, both radiances and retrieved geophysical parameters, are desired with high accuracy in this context. The observations of past and present satellite missions can as an ensemble meet many requirements. However, each single mission has its associated strengths and weaknesses in terms of spatiotemporal sampling, but also with respect to measurement and retrieval capabilities as well as long-term stability and homogeneity. This implies that each single dataset has some limitations, but also specific areas in which its strengths motivate its application.

As one of its main objectives, the EUMETSAT Satellite Application Facility on Climate Monitoring (CM SAF) uses space-based observations from meteorological satellites to provide datasets of geophysical parameters suitable for climate analysis and monitoring. For this, recurring reprocessing efforts ensure enhancements in quality and stability of the datasets using latest retrieval developments and (inter-)calibration information. Related to clouds, the CM SAF activities are for the time being focussing on datasets derived from passive imager measurements such as the 28-year record of AVHRR and the 8-year record of SEVIRI.

This presentation will introduce the cloud property datasets derived in CM SAF. It will further address specific issues associated with the generation of homogeneous and consistent datasets and indicate the validation efforts done to characterize the quality. Another substantial part of the presentation will address the interpretation of the data addressing climate related questions that might be answered using these datasets.