



Climate monitoring of cloud properties from MSG: Validation of the CM-SAF fractional cloud coverage product

M. Reuter, W.Thomas

CM-SAF, Deutscher Wetterdienst (DWD)

The Satellite Application Facilities (SAF) are an integral part of the EUMETSAT ground segment. The Satellite Application Facility on Climate Monitoring (CM-SAF) supports the analysis and diagnosis of climate parameters in order to detect and understand changes in the climate system. One of these parameters is the total cloud coverage measured from the SEVIRI instrument aboard MSG. It is based on the MSG cloud mask of the Nowcasting-SAF-software. The quality of the cloud mask is especially important due to the fact that cloud coverage has a significant impact on the earth's radiation budget and furthermore it indirectly affects the quality of following products using the cloud mask as input. Only products with well known strengths, weaknesses and error characteristics are an added value in the scope of climate monitoring. This presentation focuses on the validation of the quantity "fractional cloud coverage". One year of synoptical observations (2006) on the full MSG disk was chosen as ground truth for the validation. The validation method accounts for the non uniform distribution of the synoptical observations. Bias and Kuipers Skill Score (KSS) are used as quality indicators for the cloud mask on pixel basis, while bias and standard deviation are used for the daily and monthly mean values on the 15km * 15km resolution. These quality indicators have been calculated for analyzing differences between land, sea and coast, day, night and twilight and the dependency on the satellite and sun zenith angle, the local mean time, the latitude and the cloud base height. In total, KSS and bias of the cloud mask are 0.82 and 4.4%, respectively. Daily mean values have bias of 4.9% and a standard deviation of 18.7%. The bias of the monthly mean values is also 4.9% but with a standard deviation of 11.7%. A case study with MODIS MOD06 and another case study with CALIPSO data have also been performed, confirming qualitatively the results from the validation against synoptical observations.