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Relation of Liquid Water Path to Cloud Type from SEVIRI on the Meteosat Second Generation satellite

Anke Kniffka, Maarit Lockhoff, Rainer Hollmann, and Martin Stengel
Deutscher Wetterdienst, Satellite Application Facility on Climate Monitoring, Germany (anke.kniffka@dwd.de)

A wide-field view of cloud field distribution is essential for monitoring climate variability. Clouds influence strongly the energy cycle of the earth and have therefore a major impact on the atmospheric state at shorter time periods as well as climatic relevant timescales.
In this study the relation between cloud liquid water path (LWP) and cloud type derived from the Spinning Enhanced Visible and Infrared Imager (SEVIRI) onboard the Meteosat Second Generation 2 (MSG2) satellite is analyzed. Both geophysical quantities are operationally generated by the EUMETSAT's Satellite Application Facility on Climate Monitoring (CM-SAF) and are available for the time period from 2006 onwards. This effort is part of CMSAF's main objective to provide satellite-derived geophysical parameter data sets suitable for climate monitoring using space-based observations from geostationary MSG satellites and polar orbiting NOAA and MetOp satellites. CM-SAF's product suite includes cloud parameters, radiation fluxes, surface albedo, and atmospheric water vapor, temperature and humidity profiles on a regional and partially on a global
scale.
In this presentation we focus on the analysis and statistical properties of the LWP field associated with the individual cloud type. Our results reveal, that each cloud type possesses a characteristic LWP-distribution. These frequency distributions are constant with time in the whole SEVIRI field of view, but vary for smaller regions like Central Europe. Also, the average diurnal cycle of LWP is related to cloud type with strongest diurnal variations detected for middle level clouds. Additionally the sensitivities of LWP distributions per cloud type on the surface type (land/ water) and on the season are discussed.