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Climate monitoring from space: CM SAF's new time series of cloud properties and surface radiation derived from AVHRR observations

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As component of EUMETSAT's activities in climate monitoring, the Satellite Application Facility on Climate Monitoring (CM SAF; www.cmsaf.eu) provides climate monitoring products derived from meteorological satellites. A variety of satellite instruments is exploited in order to provide information on various components of the atmospheric energy and water cycle. The Advanced Very High Resolution Radiometers (AVHRR) are in operation on-board polar-orbiting satellites since more than two decades. They therefore allow to provide long-term satellite based climate monitoring products that also cover regions with only sparse ground-based measurements. In the past, CM SAF's focus was on provision of several cloud parameters (cloud fraction; cloud type; cloud top height / temperature / pressure) as well as surface radiation parameters that were derived from AVHRR observations in near-real time for Europe and the Arctic. For Europe, the product suite also includes cloud physical products (cloud liquid water path, cloud optical thickness). CM SAF is currently working on the reprocessing of a long-time series of these parameters based on AVHRR data. Compared to previous products, the three distinct features of these new CMSAF data are: 1) consistent and traceable intercalibrated radiances, 2) based on long-term records covering the period 1982-2009 with global coverage and 3) extensive validation of the products using advanced satellite sensors and in-situ observations. Beyond the long-term monitoring of the climate system, these data sets will provide a reference to assess the quality of global climate simulations as for example used in the IPCC assessments. These comparisons will also be in turn used to characterize possible shortcomings in the satellite product. This presentation will give an overview over CM SAF's role in climate monitoring with focus on the AVHRR reprocessing activity. Validation results as well as selected spatial and temporal features of the analysed cloud properties will be shown. Furthermore, we will discuss preliminary comparisons against GCM cloud properties.