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## Extending the CM SAF global satellite-based climate data record of cloud properties

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Global data records of cloud properties are an important part for the analysis of the Earth's climate system and its variability. One of the few sources facilitating such records are the measurements of the satellite-based Advanced Very High Resolution Radiometer (AVHRR) sensor that provides spatially homogeneous and high resolved information in multiple spectral bands. This information can be used to retrieve global cloud properties covering multiple decades, as, for example, composed as part of the CM SAF Cloud, Albedo, Radiation data record based on AVHRR (CLARA) series.

In this presentation we introduce the edition 2.1 (CLARA-A2.1) of this record series, which is the temporally extended version of CLARA-A2. This extension includes three and a half more years at the end of the data record, which now covers the time period January 1982 to June 2019 (37.5 years). CLARA-A2.1 includes a comprehensive set of cloud parameters: fractional cloud cover, cloud top products, cloud thermodynamic phase and cloud physical properties, such as cloud optical thickness, particle effective radius and cloud water path. Cloud products are available as daily and monthly averages and histograms (Level 3) on a regular  $0.25^\circ \times 0.25^\circ$  global grid and as daily, global composite products (Level 2b) with a spatial resolution of  $0.05^\circ \times 0.05^\circ$ . Time series analyses of the CLARA-A2.1 cloud products show the homogeneity and stability of the extension.

In addition to the general characteristics of the CLARA-A2.1 record, we will summarize the results of the thorough evaluation efforts that were conducted by validation against reference observations (e.g. SYNOP, DARDAR, CALIOP) and by comparisons to similar well established data records (e.g. Patmos-X, ISCCP-H and MODIS C6.1). CLARA-A2.1 cloud products show generally a very good agreement with all the compared data sets and fulfil CM SAF's accuracy, precision and decadal stability requirements. As an additional aspect, we will touch upon the CLARA Interim Climate Data Record (ICDR) concept that will soon be used for extending CLARA-A2.1 in near-real-time mode.