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Extraordinary Seminar

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# The generation of satellite-based cloud property datasets for climate research

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The climatological characterization of geophysical variables in the Earth-Atmosphere system and their 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.

The Satellite Application Facility on Climate Monitoring (CM SAF) and the Climate Change Initiative (CCI) Cloud project (Cloud\_cci) are initiatives that use space-based observations from meteorological satellites to generate datasets of geophysical variables suitable for climate research. With respect to clouds, both projects focus on passive imager sensors such as AVHRR and SEVIRI to enable long-term studies on global scales as well as regional studies that require high temporal sampling.

To enhance quality and stability compared to existing datasets, latest developments of state-of-the-art satellite retrieval schemes and new (inter-)calibration information are utilized. In Cloud\_cci for example the application of an optimal estimation schemes supports spectral consistency of simultaneously derived cloud variables along with the provision of pixel-based uncertainty information.

These and further advances are required to make progress in the generation of satellite-based datasets of geophysical variables, which then allow more applications and thus will potentially lead to a better understanding of climate. This presentation will summarize the main objectives of the mentioned projects and introduce the generated cloud property datasets. Furthermore, application areas for these datasets are highlighted.