



The ESA Cloud_cci project: generation of multi-decadal consistent global data sets for GCOS cloud property ECVs using an optimal estimation approach

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In 2010 the ESA Climate Change Initiative (CCI) Cloud project was started along with 12 other CCI projects covering atmospheric, oceanic and terrestrial ECV data products. The main goal is the generation of satellite-based climate data records that meet the challenging requirements of the Global Climate Observing System (GCOS). The objective target within the ESA Cloud_cci project is the investigation of synergetic capabilities of past, existing and upcoming European and American satellite missions and thus, the generation of long-term coherent cloud property datasets covering 33 years. The cloud properties considered are cloud mask, cloud top estimates, cloud optical thickness, cloud effective radius and post processed parameters such as cloud liquid and ice water path.

In this presentation we will discuss the benefit of using an optimal estimation retrieval framework, which provides consistence among the retrieved cloud variables and pixel-based uncertainty estimates based on different passive instruments such as AVHRR, MODIS and AATSR. We will summarize the results of the first phase of the project along with further developments and improvements in the retrieval scheme and hence the quality of the cloud products carried out in the second phase of the project. Moreover, we will show exemplary results of comprehensive validation with other well established satellite data records, surface observations and cloud climatologies (e.g., PATMOS-X, ISCCP, CLARA-A2, MODIS collection 6). These inter-comparison results will show the strengths and weaknesses of the Cloud_cci datasets.