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The ESA Cloud-CCI project

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As part of ESA's Climate Change Initiative, the Cloud-CCI project, which is lead by DWD in cooperation with many international partners, has recently started.
The ultimate objective of this project is to provide long-term coherent cloud property data sets exploiting the synergic capabilities of past, existing and upcoming European and American Earth observation missions. The synergy approach allows for improved accuracies and enhanced temporal and spatial sampling of retrieved cloud properties better than those provided by the single sources. Such improvements are required by the scientific community to facilitate further progress in satellite-based climate monitoring, which supports a better understanding of the climate. Some of the primary objectives of the ESA Cloud-CCI project are (1) the development of inter-calibrated radiance data sets - so called Fundamental Climate Data Records - for ESA and non ESA instruments in an international collaboration, (2) the development of a coherent physical retrieval framework for cloud-related essential climate variables: cloud cover, cloud top height and temperature, liquid and ice water path, and (3) the development of two multi-annual global data sets for the mentioned cloud properties including uncertainty estimates. These two data sets are characterized by different combinations of satellite systems: (A)ATSR - AVHRR – MODIS and (A)ATSR - MERIS. Furthermore, a comprehensive validation of the cloud property products against ground based and other satellite based measurements will be carried out, taking into account the individual error structures of the individual observations. ESA Cloud-CCI will provide a common data base and the necessary assessment of cloud data sets as in the framework of Global Energy and Water Cycle Experiment (GEWEX). All efforts within the project include a lively interaction with the Climate Modelling User Group (CCI CMUG) consortium. In general, the developed community retrieval framework and the data sets will be open to the community, thus publicly available and usable by all scientists.
This presentation will introduce the ESA Cloud-CCI project, its objectives and plans, and its relevance for the scientific community. The presentation will further focus on one specific task of the project, which is the inter-comparison of various cloud property retrieval schemes. Through this effort, which is summarized in the term Round Robin, strengths and weaknesses of different retrieval schemes and approaches will be assessed. Besides the accuracy and stability of the schemes, assessment criteria also include the proper provision of retrieval error estimates and the applicability of the schemes in reprocessing frameworks. Preliminary results of this task will be shown and discussed.