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The HOAPS Climatology V4: updates and results from comparisons to various satellite, buoy and ship data records

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The global water cycle is a key component of the global climate system as it describes and links many important processes such as evaporation, convection, cloud formation and precipitation. Through latent heat release, it is also closely connected to the global energy cycle and its changes. The difference between precipitation and evaporation yields the freshwater flux, which indicates if a particular region of the earth receives more water through precipitation than it loses through evaporation or vice versa. On global scale and long time periods, however, the amounts of evaporation and precipitation are balanced. A profound understanding of the water cycle is therefore a key prerequisite for successful climate modelling.
The Hamburg Ocean Atmosphere Parameters and Fluxes from Satellite Data (HOAPS) set is a fully satellite based climatology of precipitation, evaporation and freshwater budget as well as related turbulent heat fluxes and atmospheric state variables over the global ice free oceans. All geophysical parameters are derived from passive microwave radiometers, except for the SST, which is taken from AVHRR measurements based on thermal emission of the Earth.
Starting with the release 3.1, the HOAPS climate data record is hosted by the EUMETSAT Satellite Application Facility on Climate Monitoring (CM SAF) and the further development is shared with the University of Hamburg and the MPI-M. While the HOAPS release 3.2 in 2012 covered the entire record of the passive microwave radiometer SSM/I, the new version of the HOAPS data set, version 4, includes also the SSMIS record up to December 2014 and uncertainty estimates for parameters related to evaporation. These HOAPS data products are available as monthly averages and 6-hourly composites on a regular latitude/longitude grid with a spatial resolution of 0.5° x 0.5° from July 1987 to December 2014 (December 2008 for HOAPS3.2). Covering nearly 28 years the new HOAPS data set is highly valuable for climate applications. The data can be retrieved from the CM SAF web user interface http://wui.cmsaf.eu and from http://www.hoaps.org.
The presentation will cover details of the HOAPS-4 release, recent enhancements as well as future plans for the further development of the HOAPS data set. E.g., for the integrated water vapour and the near surface wind speed product, a new 1D-Var based retrieval was developed.
We show the differences between the statistical retrievals used in HOAPS-3.2 compared to the new HOAPS-4 products, results from comparisons to various satellite-based data records and results from comparisons to buoy and ship observations. A specific focus is on the assessment of the stability and uncertainties.