



Nordic Seas Precipitation Ground Validation Project

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A thorough knowledge of global ocean precipitation is an indispensable prerequisite for the understanding of the water cycle in the global climate system. However, reliable detection of precipitation over the global oceans, especially of solid precipitation, remains a challenging task. This is true for both, passive microwave remote sensing and reanalysis based model estimates.

The satellite based HOAPS (Hamburg Ocean Atmosphere Parameters and Fluxes from Satellite Data) climatology contains fields of precipitation, evaporation and the resulting freshwater flux along with 12 additional atmospheric parameters over the global ice-free ocean between 1987 and 2005. Except for the NOAA Pathfinder SST, all basic state variables are calculated from SSM/I passive microwave radiometer measurements. HOAPS contains three main data subsets that originate from one common pixel-level data source. Gridded 0.5 degree monthly, pentad and twice daily data products are freely available from www.hoaps.org.

The optical disdrometer ODM 470 is a ground validation instrument capable of measuring rain and snowfall on ships even under high wind speeds. It was used for the first time over the Nordic Seas during the LOFZY 2005 campaign. A dichotomous verification for these snowfall events resulted in a perfect score between the disdrometer, a precipitation detector and a shipboard observer's log. The disdrometer data is further point-to-area collocated against precipitation from three satellite derived climatologies, HOAPS-3, the Global Precipitation Climatology Project (GPCP) one degree daily (1DD) data set, and the Goddard Profiling algorithm, version 2004 (GPROF 2004). Only the HOAPS precipitation turns out to be overall consistent with the disdrometer data resulting in an accuracy of 0.96. The collocated data comprises light precipitation events below 1 mm/h. Therefore two LOFZY case studies with high precipitation rates are presented that still indicate plausible results.

Overall, this encourages long-term measurements of ship-to-satellite collocated precipitation in the near future. These measurement campaigns are embedded in a project within the KlimaCampus at the University of Hamburg "Integrated Climate System Analysis and Prediction" (Clisap) and utilize Norwegian Coast Guard ships as instrument carriers.