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# Validation of HOAPS- and ERA-Interim precipitation estimates over the ocean

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Although precipitation is one of the key parameters of the global hydrological cycle there are still large gaps in the global observation networks, especially over the oceans. But the progress in satellite technology has provided the possibility to retrieve global data sets from space, including precipitation. Levizzani et al. (2007) showed that precipitation over the oceans can be derived with sufficient accuracy from passive microwave radiometry. Advances in analysis techniques have also improved our knowledge of the global precipitation. On the other hand, e.g. Andersson et al. (2011) or Pfeifroth et al. (2012) pointed out that even state-of-the-art satellite retrievals and reanalysis data sets still disagree on global or regional precipitation with respect to amounts, patterns, variability or temporal behavior compared to observations.

That creates the need for a validation study over data sparse areas. Within this study, a validation of HOAPS-3.0 (Hamburg Ocean Atmosphere Parameters and fluxes from Satellite Data) based precipitation at pixel-level resolution and of ERA-Interim reanalysis data for 1995-1997 is performed mainly over the Atlantic Ocean using information from ship rain gauges and optical disdrometers mounted onboard of research vessels. The satellite and ERA-Interim data are compared to the in situ measurement by the nearest neighbor approach. Therefore, it must be ensured that both observations are related to each other, which can be determined by the decorrelation lengths in space and time. At least a number of 658 precipitation events are at our disposal including 127 snow events. The statistical analysis follows the recommendations given by the World Meteorological Organization (WMO) for dichotomous or binary forecasts (WWRP/WGNE: http://www.cawcr.gov.au/projects/verification/#Methods_for_dichotomous_forecasts).

Based on contingency tables a number of statistical parameters like the accuracy, the bias, the false alarm rate, success ratio or hit rate have been computed. Summarized, the results show that HOAPS data agrees well with observations with respect to the frequency of precipitation events while ERA-Interim overestimates considerably the number of precipitation events. Results are similar for rain and snow events.

Although it is difficult to compare rain rates directly due to the limited number of collocated events and different spatial resolution, the results suggest a slight underestimation of precipitation rates by HOAPS and an overestimation by ERA-Interim.

References

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