



Evaluation of satellite and reanalysis precipitation in the tropical pacific

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For the understanding of the Earths' water and energy cycle, global precipitation monitoring is essential. Over ocean in-situ observations are almost not available and satellite derived data might be used to fill this gap in the observational network. Also reanalysis data might be an option in order to provide reliable precipitation data over the ocean. However, the reliability of these datasets can only be evaluated by validation.

Two satellite-based (GPCP, HOAPS) and two reanalysis products (ERA-Interim, MERRA) are validated against ground measurements by rain-gauge atoll station data of PACRAIN (Pacific Rainfall Database) in the tropical Pacific. Monthly means within the time period from 1989 to 2005 have been compared.

Average monthly deviations of the datasets are in the order of 20 to 30% with reference to the used atoll station data. Temporal correlations are 0.7 to 0.8 for absolute amounts and 0.6 to 0.75 for monthly anomalies. The effect of temporal sampling on the quality of the satellite product is discussed by analysis of the HOAPS and GPCP statistical error quantities. Precipitation as provided by the reanalysis show a systematic behavior, of overestimating small and medium precipitation amounts while high amounts are underestimated. This behavior is not apparent in the satellite-based data. This is a hint for a systematic drawback in the model parameterizations.