DAPAGLOCO - A global daily precipitation dataset from satellite and rain-gauge measurements

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Climate model simulations have to be compared against observation based datasets in order to assess their skill in representing precipitation characteristics. The BMBF funded project framework MiKlip (Mittelfristige Klimaprognosen) develops a global climate forecast system on decadal time scales for operational applications. Herein, the DAPAGLOCO project (Daily Precipitation Analysis for the validation of Global medium-range Climate predictions Operationalized) provides a global precipitation dataset as a combination of microwave-based satellite measurements over ocean and rain gauge measurements over land on daily scale. The DAPAGLOCO dataset is created for the evaluation of the MiKlip forecast system in the first place. Also a satellite simulator for TRMM PR is used for evaluation purposes.

The HOAPS dataset (Hamburg Ocean Atmosphere Parameter and Fluxes from Satellite data) is used for the derivation of precipitation rates over ocean and is extended by the use of measurements from TMI, GMI, and AMSR-E, in addition to measurements from SSM/I and SSMIS. A 1D-Var retrieval scheme is developed to retrieve rain rates from microwave imager data, which also allows for the determination of uncertainty estimates. Over land, the GPCC (Global Precipitation Climatology Center) Full Data Daily product is used. It consists of rain gauge measurements that are interpolated on a regular grid by ordinary Kriging. The currently available dataset is based on a neuronal network approach, consists of 21 years of data from 1988 to 2008 and is currently extended until 2015 using the 1D-Var scheme and with improved sampling. Three different spatial resolved dataset versions are available.

The evaluation of the MiKlip forecast system by DAPAGLOCO is based on ETCCDI (Expert Team on Climate Change and Detection Indices). Hindcasts are used for the index-based comparison between model and observations. Besides, an ETCCDI-based climatology of the DAPAGLOCO precipitation dataset has been derived.