



Evaluation of decadal predictions using satellite simulators and Fundamental Climate Data Records (FCDRs)

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Decadal climate predictions are commonly evaluated focusing on geophysical parameters such as temperature, precipitation or wind speed using observational datasets and reanalysis. Alternatively, satellite based radiance measurements combined with satellite simulator techniques to deduce virtual satellite observations from the numerical model simulations can be used. The latter approach enables an evaluation in the instrument's parameter space thereby reducing uncertainties on the reference side.

Here we present evaluation methods focusing on forward operator techniques for two different types of microwave based instruments, namely the Tropical Rainfall Measuring Mission (TRMM) precipitation radar (PR) and the Special Sensor Microwave Imager (SSM/I). The simulators are developed as an integrated part of the CFMIP Observation Simulator Package (COSP).

Observational data for TRMM PR are made available by NASA. The 1C21 data product is used which provides radar reflectivities for 17 years covering the period from 1998 to 2014. For SSM/I the FCDR released by CM SAF (http://dx.doi.org/10.5676/EUM_SAF_CM/FCDR_MWI/V002) is used, which provides brightness temperatures for different channels and covers the period from 1987 to 2008.

The simulators are applied to hindcast simulations performed within the MiKlip project (<http://fona-miklip.de>) which is funded by the BMBF (Federal Ministry of Education and Research in Germany). Probabilistic evaluation results are shown for TRMM PR. The sensitivity of the results to the distribution of the convective precipitation over sub-grid scales will be discussed. First results will be shown for SSM/I.