Verification, Calibration and Assessment of Predictability of medium-range climate predictions using satellite data (VECAP)

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Medium range climate predictions, the central aim of MiKliP, rely on initial as well as boundary conditions. The subsequent prediction process starting from the initial conditions and continuously modified by the boundary conditions is inherently stochastic due to the uncertainties in these initial and boundary conditions and the intrinsic nonlinear nature of atmospheric and oceanic flows and their interactions with the other earth system components amplifying the initial and boundary uncertainty. The prediction system has to take care of this uncertainty by generating an ensemble of predictions. The set of forecasts issued by an ensemble system does not provide directly the required stochastic information in terms of probabilities or probability densities. From the available samples of single forecasts a statistical post processing and a calibration/validation against observations is necessary. The calibration and validation against observations will allow an assessment of the predictability, namely is there a predictive skill of the forecasting system arising from the initial conditions beyond that skill which can be expected from simple forecasts like climate or damped persistence. Due to the fact that the prediction system will produce very large datasets it is necessary to concentrate upon predefined subsets of the forecasts. In order to connect results from calibration and validation with model development and assessment a process and scale orientated selection of model and observations datasets is the most promising way.

Therefore it is the central aim of the VECAP proposal to provide (a) methods to extract probabilistic information of medium range climate forecasts from an ensemble of climate model simulations, (b) to validate and calibrate the probabilistic information against observations and (c) to evaluate predictability of the climate forecasts in terms of predictable structures, processes or scales in space and time. This will be done on the basis of "classical" observational data sets as well as on the basis of virtual satellite measurements calculated from the climate simulations and compared to the real satellite observations. Basically this requires access to the simulation data base on HPSS and GPFS, access to local computing resources on "lizard" and only moderate access to HPC computing resources on "blizzard" at the moment.