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Assessing and Quantifying Uncertainties for Model Evaluation in the MiKlip Prediction System

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On the time scale of a few years to a few decades ahead, regional and seasonal variations in weather and climate are strongly influenced by the internal variability of the climate system. Decision makers in different areas need to know to what extent the climate events they see are caused through this natural variability or are the result of anthropogenic climate change.
The project MiKlip (www.fona-miklip.de) for medium-term climate prediction funded by the Federal Ministry of Education and Research in Germany (BMBF) has the objective to create a model system that can provide reliable decadal forecasts on climate. The system to be developed is novel in several aspects, that comes with great challenges for the methodology deployment. This concerns especially the determination of the initial conditions, the inclusion into the model of processes relevant to decadal predictions, the increase of the spatial resolution through regionalisation, the improvement or adjustment of statistical post-processing, and finally the synthesis and validation of the entire model system. The evaluation and validation of decadal prediction systems is both a technical and a scientific challenge in the recent climate research.
Therefore, part of the MiKlip project is the development of a standardized evaluation system to validate the model system. This is done in the sub-project 'Integrated data and evaluation system for decadal scale prediction' (INTEGRATION).
This presentation will focus on uncertainties in model results affected by the choice of different observation based evaluation data-sets, such as physical uncertainties that include measuring inaccuracy and methodological uncertainties (for example reanalysis data), and the prevailing verification status of the data-set. We will present first results to what extend such uncertainties affect the evaluation within the MiKlip system. The evaluation system itself comes up with a unique way to assess such uncertainties as it enables direct access to both the set of implemented observation based data-sets and the model database including the deduced data used for evaluation.
In order to point out the parts of the climate system which are affected by such uncertainties we performed systematic analyzes. The documentation of such uncertainties as part of the evaluation system considerably improved the standardized and data-set specific evaluations conducted within MiKlip.