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PDAF - features and recent developments

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PDAF, the Parallel Data Assimilation Framework (http://pdaf.awi.de), is on open-source framework for ensemble data assimilation. PDAF is designed so that it is particularly easy to use and a data assimilation system can be quickly build, while PDAF ensures the computational efficiency. PDAF consists of an ensemble-component that provides online-coupled data assimilation functionality, thus data transfers in memory and by using the MPI parallelization standard, by inserting 3 function calls into the model code. These additions convert a numerical model into a data-assimilative model, which can be run like the original model, but with additional options. While this approach is particularly efficient, it is also possible to use separate programs to compute the forecasts and the assimilation analysis update. PDAF further provides data assimilation methods (solvers), in particular ensemble Kalman filters and particle filters. Tools for diagnostics, ensemble generation, and for generating synthetic observations for OSSEs or twin experiments, provide additional functionality for data assimilation. PDAF is used for research purposes, teaching, but also operationally. In the operational context, PDAF is used at the CMEMS forecasting center for the Baltic Sea and in the Chinese Global Ocean Forecasting System (CGOFS). A recent addition to PDAF is OMI, the Observation Module Infrastructure, a library extension for observation handling. OMI is inspired by object-oriented programming, but for ease of use, it is not coded using classes. Recent developments further include support for strongly-coupled data assimilation across components of Earth system models, model bindings for NEMO, SCHISM, and the climate model AWI-CM. Further, an ensemble-variational solver is under development. This presentation discusses the PDAF's features and recent infrastructure developments in PDAF.

Which theme does your abstract refer to?

Recent assimilation infrastructure developments (e.g. OOPS, JEDI, future HPCs, etc)

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