Geophysical Research Abstracts
Vol. 18, EGU2016-3953, 2016
EGU General Assembly 2016

Comparison of different assimilation schemes in an operational assimilation system with Ensemble Kalman Filter

Yajing Yan (1), Alexander Barth (2), Jean-Marie Beckers (2), Guillem Candille (3), Jean-Michel Brankart (3), and Pierre Brasseur (3)

(1) LISTIC, Université Savoie Mont Blanc, LISTIC, Annecy-le-Vieux, France (yajing.yan@univ-savoie.fr), (2) GHER, University of Liège, Liège, Belgium, (3) CNRS, MEOM/LGGE, Université de Grenoble 1, Grenoble, France

In this paper, four assimilation schemes, including an intermittent assimilation scheme (INT) and three incremental assimilation schemes (IAU 0, IAU 50 and IAU 100), are compared in the same assimilation experiments with a realistic eddy permitting primitive equation model of the North Atlantic Ocean using the Ensemble Kalman Filter. The three IAU schemes differ from each other in the position of the increment update window that has the same size as the assimilation window. 0, 50 and 100 correspond to the degree of superposition of the increment update window on the current assimilation window. Sea surface height, sea surface temperature, and temperature profiles at depth collected between January and December 2005 are assimilated. Sixty ensemble members are generated by adding realistic noise to the forcing parameters related to the temperature. The ensemble is diagnosed and validated by comparison between the ensemble spread and the model/observation difference, as well as by rank histogram before the assimilation experiments The relevance of each assimilation scheme is evaluated through analyses on thermohaline variables and the current velocities. The results of the assimilation are assessed according to both deterministic and probabilistic metrics with independent/semi-independent observations. For deterministic validation, the ensemble means, together with the ensemble spreads are compared to the observations, in order to diagnose the ensemble distribution properties in a deterministic way. For probabilistic validation, the continuous ranked probability score (CRPS) is used to evaluate the ensemble forecast system according to reliability and resolution. The reliability is further decomposed into bias and dispersion by the reduced centered random variable (RCRV) score in order to investigate the reliability properties of the ensemble forecast system.