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The data assimilation in the ocean forecast system based on FIO-COM

The ocean forecasting system (OFS) based on the surface wave-tide-circulation coupled ocean model developed by the First Institute of Oceanography (FIO-COM), Ministry of Natural Resources, China was started its operational running since May 2016. The ensemble adjustment Kalman filter (EAKF) is designed for this OFS to assimilate the near real time oceanic observations, including the sea surface temperature (SST) derived by satellite, sea surface height (SSH) derived by satellite altimeters and Temperature and salinity profiles of Argo. There are 10 ensemble members used for the implementation of EAKF. In order to keep the ensembles maintain a reasonable spread, random noise is introduced into the initial conditions and ensemble inflation with a factor equal to 5% is applied at the daily assimilation. Although the ensemble number is relatively smaller, the computation cost is still quite huge. Recently, a sampling method based on the history simulations inspired by the NMC method is carried out to provide the ensemble with a larger number for EAKF. Some sensitive experiments are examined for comparing the performance of the original EAKF and the new scheme. The results indicated that the new scheme with a similar ensemble number could provide a close performance while the one with greater ensemble members by sampling will improve the analysis and the forecasting results. Using the sampling method or combine the sampling method and ensemble model runs could potentially employed in this system to reduce the computational cost and improving the performance of the OFS.

Which theme does your abstract refer to?

Development and assessment of data assimilation in forecasting applications (global and regional)

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