



Contribution ID: 22

Type: **Oral presentation**

Implementation and Evaluation of a High-Efficiency Coupled Data Assimilation System Using Multi-Timescale EnOI-Like Filtering with a Coupled General Circulation Model

Monday 17 May 2021 11:20 (20 minutes)

A multi-timescale high-efficiency approximate EnKF (MSHea-EnKF), which consists of stationary, slow-varying, and fast-varying filter using the time series of a single-model solution, has been implemented in the Geophysical Fluid Dynamics Laboratory's global fully coupled climate model (CM2.1) to increase the representation of low-frequency background error statistics and enhance the computational efficiency. Here, the MSHea-EnKF is evaluated in a biased twin experiment framework and a 27-year real-obs coupled data assimilation (CDA) experiment. Results show that while the computing only costs duodecimal of traditional ensemble coupled data assimilation (ECDA), the ocean state estimation quality improves 30.3% and 10.7% for upper 500m salinity and temperature, respectively, and the atmosphere state estimation has almost the same quality as traditional ECDA. It's mainly because MSHea-EnKF improves representation primarily on slow-varying background flows. The MSHea-EnKF also gets a more reasonable standard deviation distribution for Atlantic meridional overturning circulation (AMOC) and stronger meridional transport at 26.5°N below 2000m, which is closer to Rapid estimates.

Which theme does your abstract refer to?

Coupled data assimilation (ocean, atmosphere, sea-ice, waves, biogeochemistry, etc)

Author: LU, Lv (Ocean University of China)

Co-authors: Prof. ZHANG, Shaoqing (Ocean University of China); Mr JIANG, Yingjing (Ocean University of China); Mr YU, Xiaolin (Ocean University of China)

Presenter: LU, Lv (Ocean University of China)

Session Classification: Theme 2: Coupled data assimilation

Track Classification: Coupled data assimilation