A study of forecast sensitivity to observations in the Bay of Bengal using LETKF

Ensemble Forecast Sensitivity to Observations (EFSO) is used with data assimilation system to identify observations that benefit the analyses. EFSO has not yet thoroughly been tested in an ocean data assimilation system because of a lack of robust formulation of a squared norm against which beneficiality of observations can be estimated. Here, we explore the efficacy of EFSO in the ocean data assimilation system LETKF- ROMS in the Bay of Bengal by envisaging a novel squared norm. The Bay of Bengal is known for its higher stratification and shallow mixed layer depth. In view of baroclinicity representing the stratification of the ocean, we use the modulus of the baroclinic vector as the squared norm to evaluate forecast errors in EFSO. Using this approach, we identify beneficial observations. Assimilating only the beneficial observations greatly improves the ocean state. We also show that the improvements are more pronounced in the head of the Bay of Bengal where stratification is much higher compared to the r…

Biswamoy Paul1,2* Balaji Baduru1,3,4 Arya Paul1; 1Indian National Centre for Ocean Information Services, Ministry of Earth Sciences, Government of India, Hyderabad, India 2Centre for Earth, Ocean and Atmospheric Sciences, University of Hyderabad, Hyderabad, India 3Indian Institute of Tropical Meteorology, Ministry of Earth Sciences, Government of India, Pune, India 4Department of Marine Geology, Mangalore University, Mangalagangotri, Karnataka, India