



Representation of selected mesoscale eddies in the eastern tropical Atlantic in an ocean re-analysis model and in a 3D ocean reconstruction

Yinchao Chen (1), Johannes Karstensen (2), Gerd Krahnmann (2), and Pierre Testor (3)

(1) South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, China (cycshevchenko@hotmail.com), (2) GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany (jkarstensen@geomar.de), (3) Center for the National Scientific Research (CNRS), Paris, France

Mesoscale eddies are ubiquitous in the ocean and play a key role in lateral and vertical energy transfer and material transport. Sufficient representation of mesoscale eddies in ocean models is key for a realistic simulation and prediction of the ocean. Using high resolution mesoscale eddy survey data (glider, ship) from the eastern tropical North Atlantic, we conducted a comparison study with an ocean re-analysis model, that assimilates vertical profile and satellite data (GLORYS12V1), and a 3D ocean reconstruction, based on a statistical analysis of observational data (AMOR3D). For the GLORYS12V1 we find very good agreement of properties and vertical structures on the mesoscale only for those cases where mesoscale eddy survey data has been assimilated. For GLORYS12V we found a time-lag of about one week between the reanalysis dataset and the glider observation that might be related to the assimilation technique. The AMOR3D reproduced eddies but failed reproducing the vertical structure of the observed eddies. The anomalous hydrographic properties in the eddies are key for determining eddy property fluxes. Our results show that new strategies are required for representing the vertical eddy structure in order to quantify lateral property transport by mesoscale eddies, at least for the models discussed here.