Geophysical Research Abstracts
Vol. 19, EGU2017-6254, 2017
EGU General Assembly 2017

Use of the quasi-geostrophic dynamical framework to reconstruct the 3-D ocean state in a high-resolution realistic simulation of North Atlantic.

Simon Fresnay (1) and Aurélien Ponte (2)

(1) OceanDataLab, Brest, France (simon.fresnay@oceandatalab.com), (2) IFREMER, Brest, France (aurelien.ponte@ifremer.fr)

The quasi-geostrophic (QG) framework has been, is and will be still for years to come a cornerstone method linking observations with estimates of the ocean circulation and state. We have used here the QG framework to reconstruct dynamical variables of the 3-D ocean in a state-of-the-art high-resolution (1/60 deg, 300 vertical levels) numerical simulation of the North Atlantic (NATL60). The work was carried out in 3 boxes of the simulation: Gulf Stream, Azores and Reykjaness Ridge. In a first part, general diagnostics describing the eddying dynamics have been performed and show that the QG scaling verifies in general, at depths distant from mixed layer and bathymetric gradients. Correlations with surface observables variables (e.g. temperature, sea level) were computed and estimates of quasi-geostrophic potential vorticity (QGPV) were reconstructed by the means of regression laws. It is shown that that reconstruction of QGPV exhibits valuable skill for a restricted scale range, mainly using sea level as the variable of regression. Additional discussion is given, based on the flow balanced with QGPV. This work is part of the DIMUP project, aiming to improve our ability to operationnaly estimate the ocean state.