Geophysical Research Abstracts, Vol. 9, 03956, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-03956

Impact of the Mediterranean Outflow on the circulation of the Atlantic Ocean

A. Bozec (1), E. Chassignet (1) and G. Halliwell (2)

(1) COAPS/Florida State University, Tallahassee, FL, USA, (2) RSMAS, Miami, FL, USA, (abozec@coaps.fsu.edu)

Several questions remain unanswered about the actual role and the importance of the Mediterranean Overflow Water (MOW) in the global thermohaline circulation and the Atlantic Ocean circulation. What is(are) the path(s) of the MOW in the Atlantic? What are the mechanisms involved in the propagation of MOW? Does the MOW play a role in setting up the convection that takes place at high latitudes? If yes, does it enhance or weaken the convection?

To answer these questions, we investigate the variability of the MOW using a series of numerical simulations of the Atlantic Ocean performed by the HYCOM ocean model. A coarse resolution (2°) is first used to perform sensitivity experiments, a 1/3° configuration will then be used to provide additional information on the path(s) taken by the MOW and finally the 1/12° will help us to understand the importance of Meddies in the propagation of the MOW in the Atlantic.

As preliminary results, we present here the sensitivity experiments realized with the 2° configuration which parameterizes the Mediterranean Sea Outflow with the Price and Yang (1998) marginal sea boundary condition. In order to show the importance of the MOW in the convection regions as the Labrador Sea, we compare a control simulation to an experiment where the MOW is removed from the Eastern Atlantic. We also assume that the Gibraltar Strait is closed. As expected, a large decrease in salinity but also in temperature is observed from the Eastern North Atlantic (-1.3psu/-3.5°C at 1000m) to the Labrador Sea (-0.1psu/-0.5°C at 1000m) after 200 years. No significant change is however obtained in the evolution of the mixed-layer depth in the Labrador Sea.