Geophysical Research Abstracts
Vol. 14, EGU2012-13372, 2012
EGU General Assembly 2012

Hydrostatic and non-hydrostatic simulations of the East Greenland Spill Jet

M. G. Magaldi (1,2) and T. W. N. Haine (1)

(1) The Johns Hopkins University, Baltimore, Maryland, USA (Marcello.Magaldi@jhu.edu ; Thomas.Haine@jhu.edu), (2) Institute of Marine Sciences, National Research Council, Pozzuolo di Lerici (SP), Italy (marcello.magaldi@sp.ismar.cnr.it)

The cascade of dense waters off the East Greenland shelf during Summer 2003 is investigated with two very high-resolution ($\sim$0.5 km) regional simulations. The first simulation is non-hydrostatic. The second simulation is hydrostatic and about 3.75 times less expensive. Both simulations are compared to a previous 2-km hydrostatic run (about 30 times less expensive as the 0.5 km non-hydrostatic case).

All runs compare well with observations and confirm the persistence and the causes of the East Greenland Spill Jet: In some cases, a local perturbation results in dense waters descending over the shelfbreak into the Irminger Basin (Type I spilling). In other cases, surface cyclones associated with Denmark Strait Overflow deep domes initiate the spilling process (Type II spilling).

Differences among runs are quantified in terms of the surface energy spectra and the Okubo-Weiss parameter. These diagnostics are sensitive to the change in resolution and dynamics among the runs. The volume transports of Denmark Strait Overflow Water and the Spill Jet are insensitive to these configuration differences, however.