THE ROLE OF NON-HYDROSTATIC DYNAMICS IN CONTROLLING EXCHANGE ACROSS A SURFACE OCEAN FRONT

T. W. N. Haine (1), P. D. Williams (2) and J. C. Marshall (3)
(1) Earth & Planetary Sciences, Johns Hopkins University, Baltimore, MD, USA, (2) Atmospheric, Oceanic & Planetary Physics, University of Oxford, Oxford, UK, (3) Earth, Atmospheric & Planetary Sciences, MIT, Cambridge, MA, USA.
Thomas.Haine@jhu.edu

Numerical studies of surface-ocean fronts forced by inhomogeneous buoyancy loss show non-hydrostatic convective plumes co-existing with baroclinic eddies. The character of the vertical overturning depends sensitively on the treatment of the vertical momentum equation in the model. It is less well-known how the net frontal exchange is affected by these dynamics. Here, we compare well-resolved numerical experiments using non-hydrostatic and hydrostatic models and convective-adjustment parametrizations. The impact of non-hydrostatic processes on averaged frontal transfer and frontal evolution is weak compared to the affect of the baroclinic motions. We discuss the implications for parametrization of these fronts in models of the ocean general circulation.