



Thoughts on topography and potential vorticity creation

William Dewar (1), James McWilliams (2), Jeroen Molemaker (2), Nicolas Wienders (1), Otmar Olsina (1), and Andrew Hogg (3)

(1) Florida State University, Department of Oceanography, Tallahassee, FL, United States (dewar@ocean.fsu.edu, +1-(0)850-6442581), (2) UCLA, Department of Atmospheric Science, Los Angeles, CA, United States, (3) Australian National University, RSES, Canberra, ACT, Australia

The large scale circulation is approximately equilibrated, with sources and sinks broadly in balance. Most of our dynamical understanding of the general circulation is framed in terms of potential vorticity, which is fed to the ocean through interactions with the atmosphere. A now classical result is that potential vorticity is confined to potential density surfaces so that the fluxes into and out of those surfaces must balance. An analysis of the atmospheric potential vorticity flux into the North Atlantic Mode Waters suggests they do not vanish when annually averaged, arguing that lateral boundaries must play an important role in global potential vorticity budgets. Recent studies of mesoscale flows in the vicinity of boundaries are reviewed that illustrate various potential vorticity creation mechanisms.