Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

The formation of bulges and coastal currents from buoyant outflows PABLO HUQ, University of Delaware — Buoyant outflows exiting (e.g. from an estuary or a sea strait) to the coastal ocean may form large bulges and coastal currents which propagate downshelf. Laboratory experiments show that the effect of the earth's rotation is to deflect the trajectory of the buoyant outflow into an inertial circle so that the buoyant outflow impacts the coastline further downshelf at an impact angle ϕ. Bulges form if ϕ is larger than 60°. Bulges store a significant fraction of the buoyant outflow; this attenuates the scales of the downshelf coastal current. The characteristics of the coastal current also depend on the ambient depth parameter, h/H, and the bottom slope parameter R/y_B. The width of the outflow also influences whether or not bulges form; bulge formation is described by a two-parameter space comprising the ambient depth parameter h/H and the Kelvin number K. Comparisons are made with oceanic observations.

Pablo Huq
University of Delaware

Date submitted: 15 Aug 2011 Electronic form version 1.4