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Ocean Science Discussions

Interactive comment on "Transformation of an Agulhas eddy near the continental slope" *by* S. Baker-Yeboah et al.

Anonymous Referee #3

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A review of

Transformation of an Agulhas eddy near the continental slope by Baker-Yeboah, Flierl, Sutyrin and Zhang

The authors present a study of vortices interacting with lateral topography with views toward shelf-deep ocean exchange and modification of the eddies. Observations from the Agulhas region are discussed and idealized models of vortex topography interaction are compared to them. Within the confines of an idealized study, some degree of comparison between the numerical results and the observations are found. The long range objectives of such work are to quantify shelf exchange rates and understand the history of Agulhas rings.

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Interactive Discussion

Discussion Paper

On the whole, I liked this paper. The presentation is in places a bit long but it is valuable and interesting to see attempts to compare clearly 'unrealistic' models with observations. I say 'unrealistic' in the sense that the authors are not running GCMs with real bottom topography and forcing, etc. Instead they are reducing the problem to its essentials and extracting statements about physical processes.

The nature of the topography is quite severe, as seen in Fig. 1. I did wonder if there might be some value to examining the baroclinic qg problem in the presence of finite amplitude topography, as was done in Thompson (1993) and Leonov and Dewar (2008). The latter in particular argued finite amplitude topography introduced strong asymmetries into the nonlinear exchanges between the deep ocean and the shelf. This might be interesting in the present case, where exchange rates are of interest.

In summary, I recommend publication of this nice article. The other referees have pointed out some grammatical shortcomings which need attention prior to acceptance.

Two-layer quasigeostrophic flow over finite isolated topography, 1993: L. Thompson, Journal of Physical Oceanography, 23, 7, 1297-1314.

On nonlinear baroclinic trapped waves over abrupt topography, 2008, D. Leonov and WK Dewar, Deep Sea Research Part I: Oceanographic Research Papers, 55, 11, 1428-1437.

Interactive comment on Ocean Sci. Discuss., 6, 1819, 2009.