Geophysical Research Abstracts, Vol. 7, 01736, 2005
SRef-ID: 1607-7962/gra/EGU05-A-01736

Transformation of Meddies encounting a Seamount

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Transformation of self-propagating eddies encountering a seamount is explored using point vortex and finite-difference two-and-half layer models. The topography is finite in that the seamount penetrates the isopycnal on which the eddy resides, but does not span the entire fluid depth. The eddies are represented initially as generalized hetons, as suggested by Meddy observations, with a dipole moment providing self-propagation towards a seamount. The most significant physical mechanism affecting transformation is eddy interaction with the circulations caused by the topography, both by fluid removed from the seamount and by external fluid stranded on or near the seamount. Such interactions result in eddy propagations at various angles to the initial drift direction and in an increased incidence of eddy destruction. Analytical and numerical estimates of transformed eddy structure and propagation speed indicate that topographic interactions provide powerful mechanisms for significantly influencing Meddy evolution.