



Overshoot and retroreflection of a separated western boundary current

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The overshoot of a western boundary current separated from the continent is investigated for no-slip boundary conditions. It is shown that in cases where separation from the coast is 'forced' by the vanishing of the continent, considerable poleward overshoot is a solution to the steady state equations. The overshoot is caused by the advection of relative vorticity, and its meridional extent is determined by the strength of the in-shore vorticity and the diffusion of vorticity across the separated current. As the separated current bends westward, this diffusion has an increasing meridional component, which allows for the meridional transport of vorticity, and hence a relaxation of Steward's [1961] constraint on the production and removal of vorticity along latitudes.

The retroreflection of the Agulhas Current south of Africa is discussed in the light of these results.