



Abstract View

[Volume 18, Issue 8 \(August 1988\)](#)

Journal of Physical Oceanography

Article: pp. 1178–1192 | [Abstract](#) | [PDF \(892K\)](#)

Vortex Generation Through Balanced Adjustment

James C. McWilliams

National Center for Atmospheric Research, Boulder, Colorado

(Manuscript received September 23, 1987, in final form February 23, 1988)

DOI: 10.1175/1520-0485(1988)018<1178:VGTBA>2.0.CO;2

ABSTRACT

The problem of geostrophic adjustment, originally considered by C.G. Rossby, is solved in an axisymmetric geometry for a continuously stratified fluid, where the adjusted final state is in hydrostatic, gradient-wind balance. This problem is relevant to the generation of submesoscale coherent vortices in the ocean: diapycnal mixing events can create a local anomaly of less strongly stratified fluid, which then develops a balancing circulation through adjustment. An analytical solution is obtained for a few uniform-density layers, and this is compared with numerical solutions for continuous stratification. In both representations, two-dimensional solutions are compared with axisymmetric ones.

Options:

- [Create Reference](#)
- [Email this Article](#)
- [Add to MyArchive](#)
- [Search AMS Glossary](#)

Search CrossRef for:

- [Articles Citing This Article](#)

Search Google Scholar for:

- [James C. McWilliams](#)

top ▲



© 2008 American Meteorological Society [Privacy Policy and Disclaimer](#)

Headquarters: 45 Beacon Street Boston, MA 02108-3693

DC Office: 1120 G Street, NW, Suite 800 Washington DC, 20005-3826

amsinfo@ametsoc.org Phone: 617-227-2425 Fax: 617-742-8718

[Allen Press, Inc.](#) assists in the online publication of AMS journals.