



## Abstract View

[Volume 12, Issue 9 \(September 1982\)](#)

### Journal of Physical Oceanography

Article: pp. 952–959 | [Abstract](#) | [PDF \(718K\)](#)

# On the Parameterization of Diapycnal Fluxes due to Double-Diffusive Intrusions

**Christopher Garrett**

*Department of Oceanography, Dalhousie University, Halifax, N.S., Canada B3H 4J1*

(Manuscript received December 8, 1981, in final form May 13, 1982)

DOI: 10.1175/1520-0485(1982)012<0952:OTPODF>2.0.CO;2

### ABSTRACT

An attempt is made to parameterize the large-scale average diapycnal (cross-isopycnal) mixing that presumably occurs in the thermohaline fronts that develop when large-scale epipychnal (along-isopycnal) gradients of  $T$  and  $S$  are stirred along isopycnals by mesoscale eddies. It is assumed that double-diffusive intrusions develop at the fronts and that their thickness is given by the formula of Ruddick and Turner (1979). This, combined with a crude estimate of the frontal width and a very over-simplified model of the eddy field, leads to a formula for the average diapycnal diffusivity for salt or some neutral tracer, and suggests that the mechanism is important in weakly stratified water with a large epipychnal gradient of salinity. The diapycnal eddy diffusivities for temperature is negative for a stably stratified temperature field. However, the opposite signs of the diapycnal diffusivities for salt and heat are unlikely to lead to observable consequences on account of the dominance, in fluxes across isopleths of  $T$  or  $S$ , of down-gradient epipychnal transports.

#### Options:

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

#### Search CrossRef for:

- [Articles Citing This Article](#)

#### Search Google Scholar for:

- [Christopher Garrett](#)



© 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](mailto:amsinfo@ametsoc.org) Phone: 617-227-2425 Fax: 617-742-8718  
[Allen Press, Inc.](#) assists in the online publication of *AMS* journals.