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Volume 16, Issue 4 (April 1986)

Journal of Physical Oceanography
Article: pp. 728–740 | Abstract | PDF (882K)

Eddy Heat Flux in the Subtropical North Pacific

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(Manuscript received June 12, 1985, in final form October 13, 1985)

DOI: 10.1175/1520-0485(1986)016<0728:EHFITS>2.0.CO;2

ABSTRACT

Meridional eddy heat flux in the subtropical North Pacific is estimated from TRANSPAC ship-of-opportunity data collected during 1976–80. Two methods are used. The first fits simple functional forms to be temporal anomalies of the temperature field; thermal wind velocities are derived analytically and the presence of vertical phase tilts lead to transient eddy heat fluxes between 140° and 170°E of +0.01 PW at 32°N in particular. This estimate includes contributions from a range of zonal wavenumber.

The second method calculates thermal winds relative to 400 m bv simple differences on the data grid. Transient and stationary eddy heat fluxes between Japan and 120°W are derived: the former are typically +.02 PW while the latter has a maximum of +0.1 PW at 32°N associated with the meander in the Kuroshio Current over the Sititõ Ridge. relative to 1000 m, the stationary eddy heat flux may be as high as 0.4 PW.

Our total eddy heat flux of +0.4 PW, combined with classical hydrographic estimates, is consistent with recent surface budget studies but not with atmospheric residual fluxes.

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