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Poleward Heat Fluxes in Southern Hemisphere Oceans

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ABSTRACT

A direct estimate of oceanic meridional heat flux at 30°S yields a result between $+1.15 \times 10^{15}$ W and $+2.27 \times 10^{15}$ W. The estimate is based on hydrographic data from individual cruises and climatological wind data. The northward sign of the flux is due largely to the baroclinic flux components, and it contradicts the indirect estimate of Sellers (1966) based on meteorological data only.

The mid-ocean eddy field introduces variability into the estimates, but a 95% confidence interval is calculated to be only $\pm 0.8 \times 10^{15}$ W. The actual baroclinic heat flux due to the mid-ocean eddies is estimated to be only about 10^{15} W in magnitude, but the actual barotropic eddy heat flux may be at least as large as 10^{15} W.

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