Abstract View

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The Net Transport of the Antarctic Circumpolar Current through Drake Passage

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ABSTRACT

Estimates of the net transport through Drake Passage are made for three periods during which the year-long DRAKE 79 current meter array spanning the Passage was in operation. Relative geostrophic shears from hydrographic surveys in January 1979, April 1979 and January 1980 were referenced to directed speed measurements to give profiles of net speed. Direct measurements were averaged in time to make them more compatible with the spatially-averaged baroclinic shears. The agreement between directly-measured and baroclinic shears is generally good except in regions of large bathymetric relief and during periods when current cores were shifting past or between moorings.

The presence of cold-core rings during two of the DRAKE 79 hydrogaphic surveys resulted in intensified flow and increased transport within fronts, but did not affect the net transport through the Passage. The three latest estimates of net transport (117, 144 and 134 × 10^6 m^3 s^{-1}) are in close agreement with a previous estimate of 124 × 10^6 m^3 s^{-1} made from 1975 data using the same technique. The consistency of thew four Estimates suggests that the net transport may be less variable than some previous calculations have implied.