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A Cyclonic Eddy in the Antarctic Circumpolar Current South of Australia: Results of Soviet-American Observations Aboard the R/V *Professor Zubov*

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ABSTRACT

Hydrographic, expendable bathythermograph and 16-day current meter records are combined to describe the oceanic structure south of Australia (along 132°E) between 24 January and 1 March 1977. A strong cyclonic eddy, containing Antarctic Surface Water from south of the Polar Front, is found to the south of and combined with a meander of the Subantarctic Front. Current meters moored in and north of the eddy indicate deep flow to the west suggesting anticyclonic circulation below 2000 m. Three thermal surveys along with current meter records document the north-northeastward movement of the eddy at an average speed of 3 cm s^{-1} . Directly measured zonal currents were highly coherent in the vertical and showed significant spectral peaks at a period of 2 days. Daily mean measured currents are shown to be highly geostrophic and geostrophic transports (relative to the bottom) give a net eastward transport through the section along 132°E of $165 \times 10^6 \text{ m}^3 \text{ s}^{-1}$.

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