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Wind Gyres in Circumpolar Oceans

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ABSTRACT

The interaction between a close wind-gyre and a neighboring eastward current is investigated using a hierarchy of increasingly complex analytical models. The method used to determine the vertical structure is that proposed earlier by Rhines and Young. In contrast to the cases they studied, with no current present, it is found that the wind-induced circulation is not depth-limited, but extends to the ocean bottom. This difference is due to the presence of the current, which allow the wind forcing to be communicated to the remote deep water through the vertical propagation of stationary Rossby waves.

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