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Baroclinic Instability in Drake Passage

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ABSTRACT

A linearized baroclinic instability model is applied to the Drake Passage area. The predictions of the model are found to be in good agreement with observations. Temporal and spatial scales are predicted accurately and the vertical structure of the most unstable wave is consistent with observations. Results indicate that the observed release of potential energy from the mean state in this area is made possible by the presence of a negative gradient of mean potential vorticity at and near the lower boundary. Further, it is found that the model results are stable with respect to variations of the mean velocity field which might be incurred by errors in the data; explanations for this insensitivity are given.

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