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Origin of the Coastally Trapped Waves Observed during the Australian Coastal Experiment

Allan J. Clarke

Department of Oceanography and Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, Florida 32306

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ABSTRACT

Freely propagating coastally trapped waves (CTWs) dominated the large alongshore-scale low-frequency variability in the Australian Coastal Experiment (ACE). Two analytical models are used to demonstrate that these waves are not due to wave energy propagating freely through Bass Strait from the Southern Australian wave guide, but rather are largely generated by the very strong low-frequency winds in Bass Strait. The first model shows that the considerable CTW energy flux from the Southern Australian shelf wave guide does not propagate through Bass Strait. It is either frictionally dissipated at the northwest entrance to Bass Strait or travels southward along the western Bass Strait escarpment as “escarpment” waves and then southward along Tasmania's west coast as coastally trapped waves. The second model is used to calculate the eastward energy flux at the eastern end of Bass Strait assuming that all of this flux is generated by the very strong winds in Bass Strait. The calculations show that the size of this flux is consistent with the amount entering the ACE region.

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Headquarters: 45 Beacon Street Boston, MA 02108-3693
DC Office: 1120 G Street, NW, Suite 800 Washington DC, 20005-3826
amsinfo@ametsoc.org Phone: 617-227-2425 Fax: 617-742-8718
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