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A Systematic Search for Trapped Equatorial Waves in the GATE Velocity Data

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ABSTRACT

Moored current meter data taken over a 60-day period during GATE (GARP Atlantic Tropical Experiment) near the equator at 28°W, have been systematically searched for vertically propagating equatorially trapped waves. Three independent tests requiring consistency among the vertical wavenumber, horizontal dispersion relation and meridional eigenfunctions have been applied. In this particular realization, we observed four frequency bands to be consistent with equatorial inertia-gravity wave dynamics. The characteristic periods and meridional mode numbers of the waves are $T = 3.4$ days, $n = 6$; $T = 5.7$ days, $n = 3$; $T = 7.1$ days, $n = 5$; and $T = 9.5$ days, $n = 2$. The results imply westward group speed in three of the four cases. However, the vertical group speed is downward in every case.

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