



Abstract View

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Internal-Inertial Waves in a Sargasso Sea Front

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ABSTRACT

This work examines the presence of internal-inertial waves in a front in the North Atlantic subtropical convergence zone. Results of Doppler shear profiler and towed thermistor chain surveys are displayed to document the position and magnitude of the front. Objective maps of the total measured velocity are computed and subtracted from the observed velocity fields. The remaining wave signal is processed to yield horizontal (towed) and vertical (dropped) kinetic energy spectra across the front. From these, rotary spectra are also computed along the line of tow and in the vertical to determine the horizontal and vertical anisotropy. It is found that several nearly monochromatic waves are propagating northward and southward from the front with horizontal length scales of ~ 32 – 50 km. It was also discovered that the region of anticyclonic frontal vorticity exhibits an excess of downgoing energy at the longest vertical wavelength thus sampled (~ 50 m), while the region of cyclonic vorticity possesses more upgoing than downgoing energy at the same wavelengths. Vertical and horizontal spectra variances of the total kinetic energy within the region of the front are each enhanced by a factor of about five over the variances outside the front. These results are discussed in the light of recent work by Kunze.

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