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[Volume 11, Issue 9 \(September 1981\)](#)

Journal of Physical Oceanography

Article: pp. 1248–1257 | [Abstract](#) | [PDF \(764K\)](#)

Observations of the Near-Surface Internal Wavefield

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(Manuscript received February 9, 1981, in final form May 18, 1981)

DOI: 10.1175/1520-0485(1981)011<1248:OOTNSI>2.0.CO;2

ABSTRACT

During January 1977 a cruise was conducted off the California coast on the Research Platform FLIP. Repeated temperature profiling devices were used to sense the internal wavefield in the top 400 m of the sea. From a sequence of 8192 profiles, vertical-velocity spectra and vertical coherence were calculated. Near-surface coherence was found to increase with increasing frequency between local inertial and Väisälä frequencies. Below 200 m the coherence was approximately constant with frequency. The near-surface change in the vertical coherence patterns results from the selective attenuation of the longer vertical wavelengths as the surface is approached. From frequency-depth changes in the near-surface coherence, variations of the internal-wave spectral form can be inferred, in spite of the fact that the deep vertical coherence remains constant. This near-surface effect is not so apparent in data from horizontal-velocity sensors, as only the vertical component of motion is constrained to vanish at the sea surface.

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