Abstract View

Volume 10, Issue 3 (March 1980)

Journal of Physical Oceanography
Article: pp. 385–398 | Abstract | PDF (746K)

Properties of Near-Surface Inertial Oscillations

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(Manuscript received July 11, 1979, in final form October 19, 1979)

DOI: 10.1175/1520-0485(1980)010<0385:PONSIO>2.0.CO;2

ABSTRACT

Inertial oscillations in current records in the top 100 m of the ocean collected on three moorings 50 and 70 km apart are examined. At 12 and 32 m depth the records are horizontally coherent at inertial frequencies and wavelengths between 700 and 1700 km are suggested. At 52 and 72 m depth, records are not horizontally coherent. Vertical wavelengths in the seasonal thermocline lie between 100 and 200 m. Significant differences between the 12 m currents are related to differences in wind over the 50 km spacing, and can be modeled by forcing the Pollard and Millard (1970) model with the local wind. Analysis of the inertial oscillations generated by a well-developed traveling depression suggests that their amplitudes can fall to zero within a few tens of kilometers of the storm track. The waves propagate along paths parallel to the storm track, but form a system of standing waves perpendicular to it. During periods of strong inertial wave generation up to two-thirds of the horizontal kinetic energy in the mixed layer is at near-inertial frequencies. The vertical component of the group velocity in the top 100 m is downward, confirming that the flow of energy is down from the surface.