



Pressure perturbations induced by mode-1 depression internal solitary waves

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Large-amplitude mode-1 depression internal solitary waves produce pressure perturbations of $O(10\text{ cm})$ near the bottom in the South China Sea. Comparing with ADCP measurements near the bottom, the observed pressure perturbation is predicted well by the Bernoulli balance. The difference is likely due to effects of the diabatic process and that the streamline is not at constant depth near the bottom. The nonhydrostatic component of pressure perturbations has an opposite sign at the trough and the same sign at the front and rear ends of solitary internal waves. The shape of observed pressure perturbations is perfectly correlated with that predicted from the Bernoulli balance. This analysis concludes that internal solitary waves can be captured directly from a bottom mounted pressure sensor. Providing the wave speed and stratification profile, the kinematic properties of internal solitary waves could be inferred from pressure perturbations at the bottom.