Abstract View

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Discrimination between Internal Waves and Temperature Finestructure

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ABSTRACT

Discrimination between internal waves and finestructure in the ocean is made difficult because of over-lapping scales of each process. We have assumed as a working hypothesis that low frequency/wavenumber variability is predominantly wave-like, while high frequency/wavenumber variability is step-like. Thermal finestructure is modeled as a steppy Poisson process in the vertical, while internal waves are modeled as a random Gaussian process. The model developed is an extension of one of McKean (1974). We describe the vertical temperature spectrum of finestructure, and moored temperature and temperature difference measurements of the internal wave experiment (IWEX). For the data considered, the contamination of moored spectra and cross-spectra is small for low frequencies. The vertical temperature difference, measured over a vertical distance which is small compared to the correlation length of the internal wave field, is shown to provide a critical check of the model, since this signal is directly related to finestructure variability. Thus, it appears possible to use moored differential temperature sensors as monitors of finestructure activity.