



## Abstract View

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# Variations in the Intensity of Small-Scale Mixing in the Main Thermocline

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### ABSTRACT

Three cruises to the same site in the central North Pacific (28°N, 155°W) found naked differences in the levels of small-scale turbulent activity as indicated by spectra of temperature profiles. Considering the data from all depths the mean values of the normalized variance of the temperature gradients, or Cox number, were 2 (September 1971), 10 (June 1973) and 59 (February 1974). Data taken during winter at a corresponding site in the South Pacific (28°S, 155°W) were similar to the latter values. The most active records were found below the main thermocline or in the seasonal thermocline and exhibited gradient spectra with slopes between  $+1/2$  and  $+1$  from 2 cpm to greater than 90 cpm. The less active records were diffusively cut off for  $k > 10$  cpm. The level of microstructure activity was not related to the spectral levels at lower wavenumber. The variance of the more active records was contributed by several intense patches a few meters thick, which had ranges of greater than a decade in the gradient spectra with spectral slopes of  $+1/2$  to  $+1$ . One of the patches contained a 1.3 m density instability similar to overturning vortex structures studied in laboratory experiments. Even in the active patches the spectra did not resemble the forms seen in fully developed homogeneous turbulence. A few records taken at abyssal depths were not markedly different from the moderately active records in the thermocline.

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