



Abstract View

[Volume 17, Issue 9 \(September 1987\)](#)

Journal of Physical Oceanography

Article: pp. 1348–1355 | [Abstract](#) | [PDF \(768K\)](#)

Observations of Small-Scale Mixing Processes in the Seasonal Thermocline, Part II: Wave Breaking

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(Manuscript received February 27, 1985, in final form March 2, 1987)

DOI: 10.1175/1520-0485(1987)017<1348:OOSMP>2.0.CO;2

ABSTRACT

Towed thermistor chain measurements are used to describe a large patch of ocean fine- and microstructure. In contrast to the relatively quiescent salt-fingering conditions of Part I, the 3-km long by 5–10-m high patch is in a frontal zone where background shear is enhanced by an inertial wave (Mied et al.). It is conjectured that an embedded, coherent structure resembling a series of breaking waves is creating the smaller-scale activity. The waves have lengths of 30–50 m which are not incompatible with Kelvin-Helmholtz shear instabilities growing in an observed low-Richardson number layer. Ongoing mixing in the patch is inferred from large values of Cox number, fluctuation length scales which scale with the Cox number, and gradient microstructure spectra which increase as (wavenumber)⁺¹ and are often unresolved at the higher values of Cox number.

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