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Microstructure measurements in the East China Sea

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Measurements of turbulence structure were obtained in the East China Sea with strong tidal motion during a focused field campaign in August, 2005, using a modern microstructure profiler Turbomap. The Turbomap measurements were conducted at 31 survey stations and 57 profiles were also obtained at a station every 6 minutes on average. The microstructure profiler measures micro-scale velocity shear and temperature, as well as conventional CTD variables (conductivity, temperature and pressure). The turbulent energy dissipation rate shows remarkable differences in vertical structure, ranging from 10^{-9} to 10^{-5} W/kg. In the thermocline, The dissipation rate with average value of 10^{-7} W/kg follows closely the pycnocline displacements caused by internal waves. It was also observed that episodic intrusions of enhanced near-bottom turbulence into the upper layers, which are probably related to the tidal cycle in the region. Except for surface layer and near-bottom layer, vertical eddy diffusivity is generally around 10^{-4} m^2/s. Near bottom, vertical eddy diffusivity reaches to 10^{-2} m^2/s due to both of weak stratification and strong dissipation rate.