

Abstract Submitted
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Shear and scalar spectra computed with a shell model of stratified turbulence JUAN EZEQUIEL MARTIN, Hydrosystems Laboratory, Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, CHRIS R. REHMANN, Department of Civil, Construction and Environmental Engineering, Iowa State University, Ames, IA — Oceanographers fit theoretical spectra to measured spectra to estimate the rates of dissipation of turbulent kinetic energy and temperature variance. However, the validity of the theoretical forms of the spectra has been questioned. The present work investigates the validity of the method by generating spectra with a shell model of turbulence. Shell models are dynamic systems that share some statistical properties with the Navier-Stokes equations. The equations proposed by Yamada and Ohkitani (1987) for the velocity field and by Jensen et al. (1992) for a passive-scalar field have been modified to include a mean scalar gradient and effects of buoyancy. The modified system allows us to study the validity of the proposed spectra as well as the effect of several parameters such as the Prandtl number and the strength of the stratification.

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