Abstract Submitted
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Turbulent Shear and Internal Waves JAMES MUNROE, BRUCE SUTHERLAND, University of Alberta — A series of experiments is presented that model the generation of non-hydrostatic internal gravity waves in upper ocean by the forcing of wind driven turbulent eddies in the surface mixed layer. A turbulent shear layer is forced by a conveyor belt with affixed flat plates near the surface of a stratified fluid and downward propagating internal waves are generated. The turbulence in the shear layer is characterized using particle image velocimetry to measure the kinetic energy as well as length and time scales. The internal waves are measured using synthetic schlieren to determine the amplitudes, frequencies, momentum fluxes, and the energy of the generated waves. The fraction of energy that leaks from the mixed layer to the internal wave field is presented. Consistent with other studies, it is found that the frequencies of internal waves generated by turbulence are an approximate constant fraction of the buoyancy frequency. Implications to internal waves propagating into the deep ocean will be discussed.

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