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Numerical and observational investigation of small-scale wave interactions with time-dependent shears in the ocean. JULIE VANDERHOFF, Brigham Young University, JAMES ROTTMAN, KEIKO NOMURA, University of California San Diego, ROB PINKEL, Scripps Institute of Oceanography — We study the interactions of internal waves in a realistic ocean environment using ray theory and numerical simulations by following an initial spectrum of short waves as they propagate through near inertial waves. We also analyze observational data taken on the stationary Floating Instrument Platform over Kaena Ridge, Hawaii as a part of the Hawaiian Ocean Mixing Experiment. We are looking for signs that an interaction is occurring between small-scale, high-frequency waves and the inertial shear. Then we relate the observational conclusions to the results of the ray theory and numerical simulations. A strong coherence between the inertial shear and the strain rate field is found in all three methods of analysis, showing the short waves are being affected by the inertial wave. An analysis of the triple product of the Reynold's stress and inertial shear shows the short waves tend to have a net transfer of energy to the inertial shear. Calculating short wave overturning shows that when the short waves strongly refract in the inertial wave they may take enough energy from the inertial wave to break.

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