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Propagation of internal waves through time-dependent shear profiles in the ocean and atmosphere JULIE VANDERHOFF, Brigham Young University — Internal wave breaking in the ocean and atmosphere leads to mixing of pollutants and nutrients, contributes to the global mixing budget, and is necessary for the overall global circulation. Locations and magnitudes of this breaking are not fully understood. Internal waves are constantly being generated throughout the ocean and atmosphere. These waves can propagate long distances before breaking and dissipating. They will interact with other flow phenomenon as they propagate, including strong shear profiles, inertial scale waves, and vortex dipoles, as examples of a few. These interactions may lead to breaking, change the physical parameters of the short wave (including wavenumber and amplitude), change their direction of propagation (turning points), or shift them hundreds of kilometers from their original path. Ray tracing and numerical simulations are used to better understand the three-dimensional dynamics of these types of interactions. Results will be compared to previous experimental work and ocean observations from the Hawaiian Ocean Mixing Experiment. The results of these interactions further our knowledge of the evolution of the energy spectrum and give insight into how locally generated internal waves can contribute to the global energy budget.

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