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**Laboratory measurements of the effect of internal waves on sound propagation** LIKUN ZHANG, University of Texas at Austin and University of Mississippi, HARRY L. SWINNEY, University of Texas at Austin, YING-TSONG LIN, Woods Hole Oceanographic Institution — The fidelity of acoustic signals used in communication and imaging in the oceans is limited by density fluctuations arising from many sources, particularly from internal waves. We present results from laboratory experiments on sound propagation through an internal wave field produced by a wave generator consisting of multiple oscillating plates. The fluid density as a function of height is measured and used to determine the sound speed as a function of the height. Sound pulses from a transducer propagate through the fluctuating stratified density field and are detected to determine sound refraction, pulse arrival time, and sound signal distortion. The results are compared with sound ray model and numerical models of underwater sound propagation. The laboratory experiments can explore the parameter dependence by varying the fluid density profile, the sound pulse signal, and the internal wave amplitude and frequency. The results lead to a better understanding of sound propagation through and scattered by internal waves.

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