Abstract Submitted
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Experimental Observation of Internal Gravity Waves[1] CONNER LARUE, MICHAEL ALLSHOUSE, University of Texas at Austin, Center for Nonlinear Dynamics, Department of Physics, FRANK LEE, University of Texas at Austin, Department of Physics, HARRY SWINNEY, University of Texas at Austin, Center for Nonlinear Dynamics, Department of Physics — In the oceans, internal gravity waves transport energy and momentum from local generation near the seafloor to the ocean surface level. These internal waves, present for density-stratified fluids in a gravitational field, play a significant role in ocean mixing. Our goal is to determine how internal waves modify the fluid's density field. We investigate internal wave dynamics in a 4-meter long laboratory tank filled with water whose density increases with depth, just as in the oceans. Density perturbations by internal waves distort the light paths through the tank. The optical distortion is examined using a "synthetic schlieren" technique, which measures the index of refraction field. Digital movies of light transmitted through the tank are used in the schlieren technique to deduce the time-dependent density gradient field. From the density gradient field we compute the energy flux in the internal gravity waves. Internal wave energy plays a significant but poorly understood role in the energy budget of the oceans.

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