

Abstract Submitted  
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**Determining Pressure and Velocity Fields from Experimental Schlieren Data**<sup>1</sup> FRANK M. LEE, MICHAEL R. ALLSHOUSE, P.J. MORRISON, HARRY L. SWINNEY, UT Austin — Internal gravity waves generated by tidal flow over bottom topography in the ocean are important because they contribute significantly to the energy composition of the ocean. Determination of the instantaneous internal wave energy flux requires knowledge of the pressure and velocity fields, each of which is difficult to measure in the ocean or the laboratory. However, the density perturbation field can be measured using a laboratory technique known as “synthetic schlieren.” We present an analytical method for deducing both the pressure and velocity fields from the density perturbation field. This yields the instantaneous energy flux of linear internal waves. Our method is verified in tests with data from a Navier-Stokes direct numerical simulation. The method is then applied to laboratory schlieren data obtained for the conditions in the numerical simulations.

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