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Experimental Investigation of Dispersive Shock Waves in Shallow Water ADAM BINSWANGER, University of Colorado at Boulder, Dispersive Hydrodynamics Laboratory, PATRICK SPRENGER TEAM, MARK HOEFER COLLABORATION — Supersonic flow past a slender wedge is a canonical problem of interest in compressible fluid dynamics. However, the experiments are extremely delicate and require experimental expertise. Simpler experiments in which supercritical shallow water flows past a wedge have been implemented under the auspice of the hydraulic analogy. In doing so, the resulting shock was found to be an oscillatory, steady pattern now understood to be an oblique dispersive shock wave (DSW), paralleling similar phenomena in nonlinear fiber optics, ultra-cold atoms, and internal and surface water waves. We implement a similar shallow water experiment in which a sluice gate controls the shallow flow at supercritical velocities that are deflected by a slim wedge. By measuring phase shifts in a sinusoidal fringe pattern projected on the water surface we can reconstruct a surface profile using the Fourier Transform Profilometry technique. The experimental setup and image processing will be detailed and illustrative experimental surface wave profiles will be given.

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