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Using the inviscid Burgers equation and the nonlinear shallow water equations to compute the time of wave breaking.

The inviscid Burgers equation and the nonlinear shallow water equations are solved numerically in application to water wave breaking. As an alternative to complicated numerical methods based on the locating the first intersection of the characteristic lines, a simple finite difference scheme is used to compute the time when the wave energy first starts to dissipate. A flux limiter is used to minimize spurious diffusion. To compensate for numerical error introduced by integrating near the steep wave front, a local averaging method is used to smooth the energy curve. The numerical results give good agreement with analytical breaking times. (Received September 14, 2014)