1002-35-175 **Hailiang Liu*** (`hliu@iastate.edu`), Carver Hall 400, Iowa State University, Ames, IA 50011.
Wave breaking in a class of nonlocal dispersive wave equations.

The Korteweg de Vries (KdV) equation is well known as a faithful approximation model for small amplitude and long waves in different physical contexts, but wave breaking phenomena related to short wavelengths are not captured in. We introduce a class of nonlocal dispersive wave equations in hopes to incorporate physics of short wavelength scales. The model is formally identified by the renormalization of an infinite dispersive differential operator, further specification is made in terms of associated conservation laws. Several well-known models are thus rediscovered. Wave breaking criteria are obtained for some typical models including the Burgers-Poisson system, the Camassa-Holm type equation and an Euler-Poisson system. (Received September 13, 2004)