1067-35-990 **Peter D. Miller*** (millerpd@umich.edu), Dept. of Mathematics, University of Michigan, East Hall, 530 Church St., Ann Arbor, MI 48109. *The Benjamin-Ono Equation in the Zero-Dispersion Limit.*

The Benjamin-Ono equation is a model for several physical phenomena, including gravity-driven internal waves in certain density-stratified fluids. It has the features of being a nonlocal equation (the dispersion term involves the Hilbert transform of the disturbance profile) and also of having a Lax pair and an associated inverse-scattering algorithm for the solution of the Cauchy initial-value problem. We will review known phenomena associated with this equation in the limit when the dispersive effects are nominally small, and compare with the better-known Korteweg-de Vries equation. Then we will present a new result (joint with Zhengjie Xu) establishing the zero-dispersion limit of the solution of the Benjamin-Ono Cauchy problem for certain initial data, in the topology of weak convergence. Our methodology is a novel analogue of the Lax Levermore method in which the equilibrium measure is given more-or-less explicitly rather than via the solution of a variational problem. The proof relies on aspects of the method of moments from probability theory. (Received September 17, 2010)