

Meeting: 1001, Evanston, Illinois, SS 14A, Special Session on Nonlinear Waves

1001-35-304 **Nghiem V. Nguyen*** (nnguyen@math.ou.edu), Department of Mathematics, University of Oklahoma, Norman, OK 73019-0315, and **John P. Albert, Jerry L. Bona** and **Yue Liu**.
Higher-Order Stability of Solitary Waves.

Consideration is given to the stability of solitary-wave solutions of several of the most prominent soliton equations in Sobolev spaces $H^n(R)$, for any $n = 1, 2, 3, \dots$. Conserved integrals involving n^{th} -derivatives and the stability results already established in the lower-order Sobolev spaces are utilized to show that solitary-wave solutions are stable in H^n . The theory therefore applies to the completely integrable Hamiltonian equations such as the KdV, mKdV, Benjamin-Ono, Intermediate Long Wave and Nonlinear Cubic Schrodinger equations.

In particular, the stability in higher-order spaces means practically that not only does the bulk of what emanates from the perturbed solitary wave stay close in shape and propagation speed to the original solitary wave, but emerging residual oscillations must also be very small and not only in the energy norm.

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