The Whitham equations for dispersionless higher order integrable systems

Virgil U. Pierce

Department of Mathematics, University of Texas – Pan American, Edinburg, TX 78539, U.S.A.

Tel: 956.381.3535, email: piercevu@utpa.edu

Abstract:

We have calculated the weak limit of the self-similar solutions of the higher order KdV equations, and of other higher order integrable systems such as the defocusing complex mKdV equations and Camassa-Holm equation. Our computations show a subtle difference in the form of solutions to the Whitham equations for these higher order problems from the lower order cases such as the KdV and NLS equations. This is joint work with T. Grava, Y. Kodama, and F.-R. Tian.

References:
1. T. Grava, V. U. Pierce, and F.-R. Tian, Initial value problem of the Whitham equations for the Camassa-Holm equation. *Physica D: Nonlinear Phenomena* **238** (2009) 55-66.
2. Y. Kodama, V. U. Pierce, and F.-R. Tian, On the Whitham equations for the defocusing complex modified KdV equation, *SIAM J. Math. Anal.* **41** (2008) 26-58. (2002).