

1052-35-258

**Antonella Marini** and **Thomas H. Otway\*** (otway@yu.edu). *Nonlinear Hodge-Frobenius equations of mixed and degenerate type.*

A class of quasilinear elliptic-hyperbolic systems is studied. The class includes the continuity equation for a steady, compressible, ideal flow which is not irrotational but is completely integrable. Other choices of the generalized mass density function reduce the system to a variety of equations in geometric variational theory and classical field theory. A class of Bäcklund transformations which relate various common choices of mass density is introduced. Technical questions to be discussed include the smoothness of solutions and the existence of a good linearization. (Received August 29, 2009)