

1126-35-396

**Timur Akhunov\*** ([akhunov@gmail.com](mailto:akhunov@gmail.com)), Department of Mathematical Sciences, Binghamton University, Binghamton, NY 13902-6000. *Wellposedness and regularity of quasilinear equations of KdV type*. Preliminary report.

We study the well-posedness of the initial value problem on the real line for the fully nonlinear evolution equations for which the leading-order terms have three spatial derivatives.

$$\partial_t u + f(\partial_x^3 u, \partial_x^2 u, \partial_x u, u, x, t) = 0$$

This problem generalizes KdV to scenarios, where there is a competition between the dispersive effects which stem from the leading-order term, and anti-diffusion which stems from the lower-order terms with two spatial derivatives. This talk reports on a wide class of equations for which weighted Sobolev spaces are not needed. In particular, these equations include quasilinear type, which exhibit this competition between dispersion and anti-diffusion: a Rosenau-Hyman compacton equation, the Harry Dym equation, and equations which arise in the numerical analysis of finite difference schemes for dispersive equations. For these quasilinear equations, our well-posedness theorem requires that the initial data be uniformly bounded away from zero.

We report on new progress in these problems and regularity properties of the solutions that arise naturally. (Received January 17, 2017)