

On the generalized KdV equation

Luiz Gustavo Farah

ICEx, Universidade Federal de Minas Gerais
Av. Antônio Carlos, 6627, Caixa Postal 702, 30123-970, Belo Horizonte-MG, Brazil.
email: lgfarah@gmail.com

ABSTRACT

In this talk we consider the generalized Korteweg-de Vries (gKdV) equation

$$\partial_t u + \partial_x^3 u + \mu \partial_x(u^{k+1}) = 0,$$

where $k \geq 4$ is an integer number and $\mu = \pm 1$. We will discuss the local and global theory for this equation in view of the recent results in [2], [3] and [4]. During the talk we also explore some open problems.

References

- [1] B. Birnir, C. E. Kenig, G. Ponce, N. Svanstedt, and L. Vega, On the ill-posedness of the IVP for the generalized Korteweg-de Vries and nonlinear Schrödinger equations, *Journal of the London Mathematical Society* **53** (1996), 551–559.
- [2] L.G. Farah, Global rough solutions to the critical generalized KdV equation, *Journal of Differential Equations* **249** (2010), 1968-1985.
- [3] L.G. Farah, F. Linares, and A. Pastor, The supercritical generalized KdV equation: Global well-posedness in the energy space and below, *Mathematical Research Letters* **18** (2011), 357-377.
- [4] L.G. Farah and A. Pastor, On well-posedness and wave operator for the gKdV equation, *Bulletin des Sciences Mathématiques* **137** (2013), 229-241.
- [5] C. E. Kenig, G. Ponce, and L. Vega, Well-posedness and scattering results for the generalized Korteweg-de Vries equation via the contraction principle, *Communications on Pure and Applied Mathematics* **46** (1993), 527–620.