

SEMINAR

Grupo de Análise Funcional e Aplicações Functional Analysis and Applications Group

Sharp blow-up stability of self-similar solutions to the modified Korteweg-de Vries equation

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Abstract

Self-similar solutions for the modified Korteweg-de Vries equation are of both physical and mathematical interest. On the physical side, among several applications, they model the formation of sharp corners in planar vortex patches. Mathematically, they describe the asymptotic behavior of solutions for large times and present a blow-up behavior at the initial time. Due to their scaling invariance, these solutions display several critical features (time decay, spatial decay and regularity), which means that the existing theory is not applicable. In this talk, I will show that the blow-up structure is stable under subcritical perturbations of any size. The proof relies on new a priori estimates for the modified KdV at critical regularity and on an infinite normal form reduction. This is joint work with R. Côte.

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