Decay properties in equations arising from fluids

Claudio Muñoz[1], Gustavo Ponce[2]

[1] University of Chile

[2] University of California Santa Barbara

In this talk our first aim is to identify a large class of non-linear functions $f(\cdot)$ for which the IVP for the generalized Korteweg-de Vries equation does not have breathers or "small" breathers solutions. Also we prove that all uniformly in time $L^1 \cap H^1$ bounded solutions to KdV and related "small" perturbations must converge to zero, as time goes to infinity, locally in an increasing-in-time region of space of order $t^{1/2}$ around any compact set in space. This set is included in the linearly dominated dispersive region $x \ll t$. Moreover, we prove this result independently of the well-known supercritical character of KdV scattering. In particular, no standing breather-like nor solitary wave structures exists in this particular regime.

References

[1] C. Muñoz, and G. Ponce, *Breathers and the dynamics of solutions to the KdV type equations,* to appear in Comm. Math. Phys.