Breathers and the Dynamics of Solutions in KdV Type Equations

Muñoz, Claudio

Ponce, Gustavo

 In this paper our first aim is to identify a large class of non-linear functions f(·) 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 ? 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? 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.