

Thresholds for global existence and blow-up in a general class of doubly dispersive nonlocal wave equations

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We establish thresholds for global existence versus blow-up for the general class of nonlocal nonlinear wave equations $u_{tt} - Lu_{xx} = B(g(u))_{xx}$, with power-type nonlinearities. This class of equations, where the nonlocality enters through two pseudo-differential operators L and B , can be considered as a generalization of the so-called double dispersion equation (see [1] for further details). Our approach is based on the potential well method which relies essentially on the ideas suggested by Payne and Sattinger [2]. Our results cover those given for many well-known nonlinear dispersive wave equations such as the so-called double-dispersion equation and the traditional Boussinesq-type equations, as special cases. This is a joint work with Husnu A. Erbay and Saadet Erbay. This work has been supported by the Scientific and Technological Research Council of Turkey (TUBITAK) under the project TBAG-110R002.

References

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- [2] *L. E. Payne, D. H. Sattinger*: Saddle points and instability of nonlinear hyperbolic equations. *Isr. J. Math.* 22 (1975), 273–303.