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Abstracts of Short Communications and Posters

Section:

10. Partial Differential Equations

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Some semilinear wave equations with nonlinear damping terms.
We consider the Cauchy or mixed problems for $u_{tt}-\Delta u+Q(u,u_t)=|u|^{p-1}u$ in $(0,\infty)\times\Omega$, where $\Omega\subset\mathbf{R}^n$ and $1<p<\infty$. Here Q is a nonlinear damping term. In the case when $\Omega\neq\mathbf{R}^n$, we impose the Dirichlet boundary condition. When $Q=|u_t|^{m-1}u_t$ with $1<m<\infty$, conditions for global existence and blow-up of a weak solution were derived by Georgiev and Todorova. We consider the case when $Q=|u|^{m-1}u_t$ with $1<m<\infty$ and $n=1$, and the conditions for global existence and blow-up of solutions will be presented. This result is joint work with Md. Abu Naim Sheikh and S. Tarama.
References: V. Georgiev and G. Todorova, Existence of a solution of the wave equation with nonlinear damping and source terms, *J. of Diff. Eqs.* **109** (1994), 295–308.