Critical exponent for semi-linear structurally damped wave equation of derivative type

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Abstract

The main purpose of this paper is to study the following semi-linear structurally damped wave equation with nonlinearity of derivative type: $$u_{tt}- \Delta u+ \mu(-\Delta)^{\sigma/2} u_t= |u_t|^p,\quad u(0,x)= u_0(x),\quad u_t(0,x)=u_1(x),$$ with $\mu>0$, $n\geq1$, $\sigma \in (0,2]$ and $p>1$. In particular, we are going to prove the non-existence of global weak solutions by using a new test function and suitable sign assumptions on the initial data in both the subcritical case and the critical case.

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