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Section:

10. Partial Differential Equations

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Can, Mehmet and Bayrak Vural, Istanbul Technical University, Turkiye

Blow up of solutions of a quasilinear hyperbolic equation with applications

In this work, the nonexistence of the global solutions of initial boundary value problems are considered for a class of quasilinear hyperbolic equations:

$$u_{tt} - \Delta u + a\Delta^2 u + b\Delta f(u) = 0, \quad (t,x) \in (0,T) \times \Omega$$

$$u(x,0) = u_0(x), \quad u_t(x,0) = u_1(x) \quad x \in \Omega$$

with dissipative terms in several different boundary conditions where Ω is a bounded domain in R^n with a sufficiently smooth boundary Γ, $T > 0$ is an arbitrary real number. The nonexistence proof is achieved by the use of the so called concavity method.