

# Existence, Asymptotic Behaviour, and Blow up of Solutions for a Class of Nonlinear Wave Equations with Dissipative and Dispersive Terms

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We consider the existence, both locally and globally in time, the asymptotic behaviour, and the blow up of solutions to the initial boundary value problem for a class of nonlinear wave equations with dissipative and dispersive terms. Under rather mild conditions on the nonlinear term and the initial data we prove that the above-mentioned problem admits a unique local solution, which can be continued to a global solution, and the solution decays exponentially to zero as  $t \rightarrow +\infty$ . Finally, under a suitable condition on the nonlinear term, we prove that the local solutions with negative and nonnegative initial energy blow up in finite time.

*Key words:* Nonlinear Wave Equation; Initial Boundary Value Problem; Global Solution; Asymptotic Behaviour; Blow up of Solutions.