

# Exponential decay and blow up of a solution for a system of nonlinear higher-order wave equations

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## Abstract

This work studies a initial-boundary value problem of the weak damped nonlinear higher-order wave equations. Under suitable conditions on the initial datum, we prove that the solution decays exponentially and blows up with negative initial energy.

## References

- [1] Adams R. A. and Fournier J. J. F., Sobolev Spaces, Academic Press, 2003.
  - [2] Georgiev V. and Todorova G., Existence of a solution of the wave equation with nonlinear damping and source terms, J. Differential Equations, 109 (2), 295–308, 1994.
  - [3] Zhou Y., Global existence and nonexistence for a nonlinear wave equation with damping and source terms, Math. Nachr, 278, 1341-1358, 2005.
  - [4] Messaoudi S. A. and Said-Houari B., Global nonexistence of positive initial-energy solutions of a system of nonlinear viscoelastic wave equations with damping and source terms, J. Math. Anal. Appl. 365, 277–287, 2010.
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