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Dynamics of a mass-spring system with a non-monotone stress-strain relation

by

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ABSTRACT

Mass-spring system with non-monotone stress-strain relation was introduced as a one-dimensional model of phase transition in a solid. The system consists of identical masses connected by springs with the stress-strain relation F(r) = r - Y(r), where Y(r) is the Heaviside function.

In this talk I will focus on the case where the system has fixed boundary on one end and free boundary on the other end. In this system a small perturbation generates the propagation of two different wave fronts. After this initial "shock propagation", the system starts to oscillate as a whole. I will show the results of numerical experiments and discuss the dynamics of this oscillation.