Komech, Alexander I.

On stabilization of string-nonlinear oscillator interaction. (English) Zbl 0859.35076

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The paper deals with an infinite homogeneous string with a particle of mass $m \geq 0$ attached at the origin. The particle is subjected to a force $F = F(u)$ which depends, in general nonlinearly, upon the transversal displacement u of the particle. Solvability of the Cauchy problem for the system is discussed. Convergence, as time $t \to \infty$, to a stationary state related to a zero b_+ of F is proved. Finally, an interesting study is made of the transition from one state $u = b_-$ to another $u = b_+$, where $F(b_\pm) = 0$. With suitable assumptions upon the data such a transition is shown to be always possible.

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MSC:

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74K05 Strings
74H45 Vibrations in dynamical problems in solid mechanics

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