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L. A. Medeiros* (luizadauto@gmail.com), Rua Voluntários da Pátria, 120/602, Rio de Janeiro, Brazil. *Vibrations of elastic string with nonhomogeneous material.*

In this paper we analyze from the mathematical point of view a model for small vertical vibrations of an elastic string with fixed ends and the density of the material is not constant. We employ techniques of functional analysis mainly a theorem of compactness for the analysis of the approximation of Faedo-Galerkin method. We obtain strong global solutions with restrictions on the initial data u_0 and u_1 , uniqueness of solutions and a rate decay estimate for the energy. (Received January 29, 2008)