



## SOLVABILITY OF A PDE MODEL WITH NONLINEAR STRESS FUNCTION HAVING SINGULARITY FOR COMPRESSIBLE ELASTIC CURVE

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**Abstract.** In this paper, we consider the initial and boundary value problem for the beam equation with the viscosity term and the compressible stress function for the nonlinear strain. We have already proved existence and uniqueness of weak solutions to the problem without the viscosity term and having a Lipschitz continuous stress function. Our aims of the present paper are to prove existence for strong and weak solutions by applying the fixed point theory and the approximation method, and to establish uniqueness by the standard Gronwall argument.

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