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Abstract

The postbuckling behavior of a compressed elastic rod is studied. The rod is supported by two identical hardening spring supports at clamped ends. The constitutive equations of the rod take into account the effect of shear. For local bifurcation analysis the Liapunov-Schmidt method is used. It is shown that for the critical value of auxiliary parameter the lowest eigenvalue becomes double. This fact and double Z_2 symmetry lead to the occurrence of secondary bifurcations for the values of auxiliary parameter near the critical one. For primary and secondary branches asymptotic expansions are constructed. Depending on the values of parameters of nonlinear spring supports and shear rigidity five different groups of bifurcation diagrams are found.

Keywords: shearable rod, nonlinear spring, mode interaction, primary bifurcation, secondary bifurcation

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