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On Stability of Systems Subject to Generalized Follower Force

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Stability and dynamics of columns and whirling shafts subject to a generalized follower force is considered in the paper. The generalized follower force is defined as one, that moves with the body on which it acts, and that always preserves the same attitude to the body as it moves. The both linear and nonlinear analysis are included. The first one relates to the influence of system parameters on the system response. It is shown that the shape of the eigenmodes depends of the value of loading. The nonlinear study is focus on the near critical behavior of the system under both tension and compression loads including analysis of the corresponding limit cycle, the effects relating to the double Hopf bifurcation are discussed.

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