Kirillov, O.N.; Sejranyan, A.P.
Instability of distributed nonconservative systems induced by small dissipation. (Russian)

A generalized non-self-adjoint eigenvalue problem for a linear differential operator with the boundary conditions is studied. Influence of small dissipation on stability is examined. A theory is developed, which describes adequately a paradoxical destabilization and which is based upon an analysis of bifurcation of multiple eigenvalues of parametric operators. Explicit expressions for jumps of critical loads, and for stability loss frequency are given. Approximate domains of asymptotic stability are indicated for a space of parameters. A problem on stability of the viscoelastic rod with small internal and external friction is solved as an application example.

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Keywords: linear differential operators; selfadjoint problem; stability; small dissipation; Keldysh chains; Whitney umbrella

Classification:
- *34D10 Stability perturbations of ODE
- 37C75 Stability theory
- 93D05 Lyapunov and other classical stabilities of control systems

Cited in ...