

Stability of Anisotropic Homogeneous Cylinder

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Abstract

This paper is devoted to studying non-static cylindrically symmetric self-gravitating system with anisotropic matter configuration and investigate its stability regions by taking homogenous model. We establish perturbed form of dynamical equations by using Eulerian and Lagrangian approaches. The conservation of baryon number is applied to obtain adiabatic index as well as perturbed pressure. A variational principle is used to find characteristic frequency which helps to compute the instability criteria. It is found that dynamical instability can be prevented till the radius of cylinder exceeds the limit $R > 18$. We conclude that the system becomes unstable against radial oscillations as the radial pressure increases relative to tangential pressure.

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