

General Relativity and Quantum Cosmology

On the stability of the shear-free condition

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The evolution equation for the shear is reobtained for a spherically symmetric anisotropic, viscous dissipative fluid distribution, which allows us to investigate conditions for the stability of the shear-free condition. The specific case of geodesic fluids is considered in detail, showing that the shear-free condition, in this particular case, may be unstable, the departure from the shear-free condition being controlled by the expansion scalar and a single scalar function defined in terms of the anisotropy of the pressure, the shear viscosity and the Weyl tensor or, alternatively, in terms of the anisotropy of the pressure, the dissipative variables and the energy density inhomogeneity.

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