Linear stability analysis of homogeneous three-dimensional turbulent flows ANAND MISHRA, SHARATH GIRIMAJI, Texas A&M University — We examine the stability characteristics of homogeneous three-dimensional mean flows. Such mean fields can be categorized based on the invariants of the velocity gradient tensor. In this study, the linear stability of different three-dimensional mean-flow topologies and the action of pressure in each category are investigated. Expressly, this entails an analysis of the Kelvin-Moffat system in Fourier space. The concomitant invariant sets and their appurtenant bifurcations are explicated. Thence, the stability characteristics of the system are analyzed, apropos individual modes (i.e., Hydrodynamic stability) and the statistical ensemble (Rapid Distortion Theory). Such understanding can lead to improved pressure-strain correlation models.

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