

Stability Analysis of Collisionless Plasmas with Active Subspaces

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Abstract

Understanding the stability of space or laboratory plasmas is important as such properties can significantly modify other aspects, such as heat flux and wave or turbulent interactions. The dependence of stability properties on physical parameters like mean and thermal velocity can be explored and quantified through dimension-reduction methods like active subspaces. In this talk, we introduce a basic kinetic model of plasma, identify and interpret stability properties near spatially-homogeneous equilibria, and discuss parameter dependence for plasmas out of thermal equilibrium, such as those often found in space.