Stability of boundary layer solutions of the Euler-Poisson equations for a multicomponent plasma

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Abstract

In this talk, we study a boundary layer, called a sheath, which occurs on the surface of materials with which a multicomponent plasma contacts. For the sheath formation, the generalized Bohm criterion demands that the ions enter the sheath region with a high velocity. The motion of the multicomponent plasma is governed by the Euler-Poisson equations, and the sheath is mathematically understood as the stationary solution to the equations. We show the unique existence and the asymptotic stability of the stationary solution under the generalized Bohm criterion.

References