

On a singular Vlasov equation arising in plasma physics.

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Abstract. Plasmas in the core of tokamaks can be modeled by a Vlasov system for the electronic and ionic distributions, coupled with an electroneutrality equation. When the electrons are assumed to be adiabatic, this system reduces to a Vlasov equation for the ionic distribution function with a force term depending on the ionic density. We discuss its singularity and its solutions of different types. Monokinetic solutions also yield global solutions to the isothermal Euler system that do not enter the frame of regular solutions to hyperbolic systems by P. D. Lax.