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Quasineutral limit for Vlasov-Poisson via Wasserstein stability estimates

The Debye length is the typical length of electrostatic interaction and in most physical situations is very small compared to the size of the domain. The so-called quasineutral limit consists in understanding the behavior of solutions of Vlasov-Poisson systems when the Debye length goes to zero. In this talk we present some recent results obtained in collaboration with Daniel Han-Kwan on the quasineutral limit of the Vlasov-Poisson equation for ions with massless thermalized electrons in dimension 1. Also, we will discuss the rigorous justification of the formal limit for very small but rough perturbations of analytic initial data for the Vlasov-Poisson equation in dimension 2 and 3.