ON THE STABILITY OF A POINT CHARGE FOR THE VLASOV-POISSON SYSTEM

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A point charge is a particularly basic and important equilibrium of the Vlasov–Poisson equations, and the study of its stability has inspired several major contributions. In this talk we present some recent work, which brings a fresh perspective on this problem. Our new approach combines a Lagrangian analysis of the linearized problem with an Eulerian PDE framework in the nonlinear analysis, all the while respecting the symplectic structure. As a result, for the case of radial initial data, we see that solutions are global and in fact disperse to infinity via a modified scattering along trajectories of the linearized flow.

This is joint work with Benoit Pausader (Brown University).