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Some recent results on stability of collisionless plasmas. Preliminary report.

A plasma is a completely ionized gas. In many applications such as in nuclear fusion or many space physical phenomena, the plasma is of high temperature and low density, and collisions can be ignored. The standard kinetic models for a collisionless plasma are Vlasov-Maxwell and Vlasov-Poisson systems. The Vlasov-Poisson system is also used to model galaxy dynamics, where a star plays the role of a particle. There exist infinitely many equilibria for Vlasov models and their stability is of central importance in physics. I will describe some of my recent works on nonlinear stability and instability of various Vlasov models. (Received February 07, 2006)