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Global classical solutions to the 3D relativistic Vlasov–Maxwell system with bounded spatial density

The relativistic Vlasov–Maxwell system (RVM in short) is a kinetic model that arises in plasma physics and describes the time evolution of a collisionless plasma whose particles interact through the self-induced electromagnetic field. The plasma is assumed to be at high temperatures, thus the particles may travel at speeds comparable to the speed of light. The main open problem concerning this system is to prove whether or not classical solutions develop singularities in finite time. Glassey and Strauss established the existence and uniqueness of local in time classical solutions for smooth and compactly supported initial data. They showed that such solutions can be continued globally in time provided the momenta of the particles are controlled. Subsequently, they proved that such control is achieved if their kinetic energy density remains bounded for bounded times. In this talk, we show that the latter assumption can be weakened to the boundedness of the spatial density.