

New results on Landau's collision kernel for Coulomb interaction

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Abstract:

The Landau equation of plasma physics was introduced in the thirties for modeling the collisions between charged particles in a plasma. In this equation appears a quadratic integrodifferential very singular kernel acting on the density of particles (w.r.t. velocities) called Landau's kernel. We first present a new estimate enabling to control a weighted H^1 norm of the square root of the density in terms of the entropy production of Landau's kernel (a quantity known to be controlled in the evolution of Landau's equation). We then present the applications of this estimate for the solutions of (the spatially homogeneous) Landau's equation, in term of smoothness as well as large time behavior.