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*Collisions in plasmas: the Landau equation*

**Abstract**

The Boltzmann quadratic integral operator describes the effect of binary collisions on the density (with respect to velocities) of molecules in a rarefied gas. In a hot plasma, the particles are charged, and the Boltzmann operator cannot be defined. It is replaced by another operator, called the Landau operator, since it was introduced by L. Landau in the thirties. The corresponding equation, called Landau equation, is a quadratic very singular parabolic equation for which strong global solutions are not known to exist except in very special situations. Recent estimates related to the entropic structure of the equation have enabled to improve the existing theory in two directions: the weak solutions are now known to be a little smoother than what was thought (work of L. Desvillettes) and an explicit estimate of "stretched exponential" convergence towards equilibrium was obtained (work of K. Carrapatoso, L. Desvillettes and L. He).