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Landau Damping in Relativistic Plasmas.

We examine the phenomenon of Landau Damping in relativistic plasmas via a study of the relativistic Vlasov-Poisson system (rVP) on the torus for initial data sufficiently close to a spatially uniform steady state. We find that if the steady state is regular enough (essentially in a Gevrey class of degree in a specified range) and that the deviation of the initial data from this steady state is small enough in a certain norm, the evolution of the system is such that its spatial density approaches a uniform constant value sub-exponentially fast (i.e. $\exp(-C|t|^{\overline{\nu}})$ for $\overline{\nu} \in (0,1)$). We take as *a priori* assumptions that solutions launched by such initial data exist for all times and that the various norms in question are continuous in time. In addition, we must assume a kind of "reverse Poincaré inequality" on the Fourier transform of the solution. In spirit, this assumption amounts to the requirement that there exists $0 < \varkappa < 1$ so that the mass in the annulus $\varkappa \leq |v| < 1$ for the solution launched by the initial data is uniformly small for all t. Typical velocity bounds for solutions to rVP launched by small initial data (at least on $\mathbb{R}^6$) imply this bound. (Received September 06, 2014)