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Halo characterization of mismatched beams using the theory of violent relaxation¹ RENATO PAKTER, YAN LEVIN, TARCISIO N. TELES, Instituto de Física - Universidade Federal do Rio Grande do Sul, Brazil — Relaxation to a final stationary state of particles interacting through long-range forces, such as Coulomb, is intrinsically different than that of systems with short-range interactions. While in the latter case it is known that the interparticle collisions drive the system to an equilibrium Maxwell-Boltzmann distribution, in the former case, the collision duration time diverges and the state of thermodynamic equilibrium is never reached. In this paper, we extend previous results on the relaxation of initially rms mismatched beams,² by taking into consideration more general initial beam distributions. We also present results on the beam relaxation and halo formation based on an approximation of the theory that allows simpler analytic expressions for the final stationary state

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²Y. Levin, R. Pakter, T.N. Teles, Phys. Rev. Lett., **100**, 040604 (2008).

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