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Halo simulations and particle tracking in intense charged particle beams CHRISTOS PAPADOPOULOS, IRVING HABER, RAMI KISHEK, PATRICK O'SHEA, MARTIN REISER, DIKTYS STRATAKIS, University of Maryland, UNIVERSITY OF MARYLAND ELECTRON RING TEAM — One of the major factors limiting the reliable transport of high intensity charged particle beams is the creation of halos of particles around the beam core. In this study, we use the WARP particle-in-cell code to numerically investigate halo creation due to beam core oscillations, for a parameter regime corresponding to the University of Maryland Electron Ring (UMER). Using particle tracking techniques in the simulations, we are able to identify the halo particles, track their orbits and study their phase space properties. The phase space distribution of the halo particles points to particle-core resonances as the underlying mechanism for halo creation, as described in the literature. In addition, we discuss the implications of using stationary and non-stationary initial particle distributions.

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