

Abstract Submitted  
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**Dynamical Properties of Relativistic Intense Electron Beams in Over-Dense Plasmas** ALAIN PIQUEMAL, CEA DAM Ile de France, Departement de Physique Theorique et Appliquee, Bruyeres-le-Chatel, Arpajon F-91297 — We investigate the evolution of intense relativistic electron beams when transported in accelerators or in over-dense plasmas. It is generally admitted that in plasmas, a beam goes progressively to a Bennett like profile and a Maxwellian distribution. But the problem is the understanding of the routes the beam follows, from a phase space limited distribution function (d.f.) at the generator output, to a Bennett-Maxwell d.f. after some distance of propagation. For this purpose, we used diagnostics from the chaos mechanics, modified to take into account time-dependent mechanisms. With these powerful tools, properties like ergodicity, mixing and self-similarity were studied. Finally, some ideas about the evolution of the beam internal structure and the mechanisms which drive this transformation, are proposed.

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