

Abstract Submitted  
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**Interplay of electrostatic and electromagnetic instabilities for ultra-intense charged particle beams in a plasma** DMITRI RYUTOV, Lawrence Livermore National Laboratory — The physics of ultra-Intense charged particle beams propagating through the plasma is of a significant interest for laboratory astrophysics. Most attention has been directed towards the analysis of electromagnetic filamentation instabilities. On the other hand, there exists a broad class of very powerful electrostatic instabilities, e.g., the Buneman instability. The author considers in a unified fashion linear theory for both types of instabilities under conditions where there is no magnetic field in an unperturbed state (i.e., the beam current is fully neutralized by the plasma current). The following factors are taken into account: the beam energy and angular spread; plasma non-uniformity; particle collisions in the background plasma. The areas of the parameter domain where one or another instability is prevalent are identified; the results are presented in the form of several easy-to-use diagrams. Prepared by LLNL under contract DE-AC52-07NA27344.

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