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Dominant unstable mode in fast electron beam plasma interaction ANTOINE BRET, Universidad Castilla la Mancha, LAURENT GREMILLET, Commissariat Energie Atomique — The interaction of a relativistic electron beam with a plasma is a subject of relevance for the Fast Ignition Scenario as well as many astrophysical settings. It has been known for long that the system is unstable with respect to many electromagnetic instabilities such as the two-stream or the filamentation instabilities. Nevertheless, recent theoretical [1] and numerical [2] investigations accounting for the whole unstable wave vector spectrum have highlighted the role of unstable modes with vector aligned obliquely with respect to the beam. In the cold fluid limit, it was proved [3] that the relativistic beam plasma system can be governed by filamentation or oblique instabilities, depending on the beam to plasma density ratio and the beam gamma factor. We here present a full kinetic extension of this previous work accounting for relativistic Maxwell-Jüttner distributions functions for the beam and the plasma return current. We find that depending on the system parameters, filamentation, oblique and even two-stream modes can govern the system. Some of the implications are discussed. [1] A. Bret, M.-C. Firpo, C. Deutsch, PRL, 94, 115002, 2005. [2] L. Gremillet et. al., 14, 040704, 2007; M.E. Dieckman et. al., PoP, 13, 112110, 2006. [3] A. Bret, C. Deutsch, PoP, 12, 082704, 2005.

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