

Abstract Submitted
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Pressure tensor dynamics in the fluid description of Weibel-type instabilities MATHIEU SARRAT, DANIELE DEL SARTO, Institut Jean Lamour, Universite de Lorraine, France, ALAIN GHIZZO, Institut Jean Lamour, Universite de Lorraine — The study of Weibel-type instabilities triggered by temperature or momentum anisotropy normally requires a full kinetic treatment, though reduced kinetic models often provide an efficient alternative, both from a computational point of view and thanks to a simplified analysis that helps a better physical insight. We here show how, similarly to reduced kinetic models, an extended fluid model including the full pressure tensor dynamics [1,2] provides a consistent description of Weibel-type modes in presence of two counterstreaming, non-relativistic beams with initially anisotropic pressures: focussing on propagation transverse and parallel to the beams we discuss the fluid dispersion relation of Weibel Instability-Current Filamentation Instability coupled modes [2] and of the time resonant Weibel instability [3]. This fluid analysis is shown to agree with the kinetic result and to allow the identification of some thermal effects, whose interpretation appeared more difficult in full kinetic descriptions.

[1] B. Basu, Phys. Plasmas 9, 5131 (2002) [2] M. Sarrat, D. Del Sarto, A. Ghizzo, EPL, 115, 45001 (2016) [3] M. Sarrat, D. Del Sarto, A. Ghizzo, to be submitted.

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