



Onset of secondary, electrostatic instabilities as a result of the saturation of the classical Weibel instability

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Weibel type instabilities, as responsible for the development of relatively strong magnetic fields, have recently received a fair amount of attention in a variety of scenarios, spanning from gamma ray burst sources to the generation of the seed magnetic field to be amplified in dynamo processes in the early universe. In this poster we present 1D and 2D kinetic PIC simulations which show that the saturation of the primary classical Weibel instability is responsible for the onset of a secondary instability electrostatic in nature. The conditions for the generation of this secondary instability, which we prove to be a two stream instability, are explained through an analysis of the evolution of the vector potential for different classes of particles. We then point out the consequences of this secondary two stream instability on the energy transfer between particles and fields and on the phase space distribution of electrons.