

A Lattice Boltzmann approach to plasma simulation in the context of wakefield acceleration

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In this talk, we present a new and efficient methodology for the simulation of fluid models in the framework of wakefield acceleration (WFA). This technique hinges on the Lattice Boltzmann Method (LBM), a popular numerical scheme used in several contexts of computational fluid dynamics and beyond, and couples it with a finite difference time domain for the solution of electromagnetic fields. We present the main features of the LBM, how the method can be adapted for the simulation of the fluid equations in the WFA, and show its core capabilities. Lastly, we discuss some performances and its numerical advantages over the state of the art in the context of WFA computer simulations.

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