

Abstract Submitted  
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**10GeV laser-plasma accelerator stage with full-PIC 3D simulations in boosted frames** SAMUEL MARTINS, LUIS SILVA, GoLP/IPFN - Instituto Superior Tecnico, Portugal, RICARDO FONSECA, DCTI/ISCTE and GoLP/IPFN - Instituto Superior Tecnico, Portugal, WEI LU, WARREN MORI, UCLA — We address full PIC simulations of the next generation of Laser Wakefield Accelerators with energy gains  $> 10\text{GeV}$ . The distances involved in these numerical experiments are very demanding in terms of computational resources and are not yet possible to (easily) accomplish. Following the work on simulations of particle beam-plasma interaction scenarios in optimized Lorentz frames by J.-L. Vay (PRL 98, 130405), the Lorentz transformation for a boosted frame was implemented in osiris 2.0, leading to a dramatic change in the computational resources required to model LWFA. The critical implementation details will be presented, and the main difficulties discussed. Quantitative comparisons between lab/boost frame results with Osiris and QuickPIC will be given. Finally, a 3D PIC simulation of a  $>10\text{GeV}$  accelerator stage will be presented, including a discussion on radiation emission.

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