



Contribution ID: 126

Type: talk

Intrinsic elimination of the numerical Cherenkov instability in Lorentz-boosted frame simulations of plasma accelerators

Wednesday, September 27, 2017 4:20 PM (20 minutes)

We present a novel Particle-in-Cell algorithm that is intrinsically free of the numerical Cherenkov instability for relativistic plasmas flowing at a uniform velocity. The new method is independent of the geometry and - unlike previous suppression strategies - we completely avoid artificial modifications of the electromagnetic fields. Application is shown at the example of Lorentz-boosted frame simulations of plasma accelerators, achieving excellent accuracy and high speed-ups using our spectral, quasi-3D GPU code FBPIC.

Primary author: KIRCHEN, Manuel (University of Hamburg)

Co-authors: MAIER, Andreas R. (University of Hamburg); GODFREY, Brendan B. (University of Maryland); DORN-MAIR, Irene (University of Hamburg); VAY, Jean-Luc (Lawrence Berkeley National Laboratory); PETERS, Kevin (University of Hamburg); LEHE, Remi (Lawrence Berkeley National Laboratory); JALAS, Soeren (University of Hamburg)

Presenter: KIRCHEN, Manuel (University of Hamburg)

Session Classification: WG6_Parallel

Track Classification: WG6 - Theory and Simulations