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Cerenkov-free RIP Maxwell solver: dispersionless along X

Thursday, September 19, 2019 6:20 PM (20 minutes)

A new multi-dimensional solver for Maxwell equations will be presented. It rips the volumetric Yee lattice to a transverse plane. The fields locations become Lorentz-invariant. The solver alleviates numerical dispersion for plane waves running along the selected axis and perfectly fits for problems of particle acceleration in plasmas. The solver has a compact local stencil and allows for parallelization along all three dimensions, while no Fourier transformations involved. Stability and accuracy of the solver will be discussed.

The Maxwell solver is free from numerical Cerenkov radiation for relativistic particles running along the selected axis in both directions.

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