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**Scalable, arbitrary-order Galilean spectral solver, for boosted-frame simulation of laser-plasma acceleration**[1] REMI LEHE, Lawrence Berkeley National Laboratory, MANUEL KIRCHEN, SOEREN JALAS, CFEL, University of Hamburg, OLGA SHAPOVAL, JEAN-LUC VAY, LBNL, ANDREAS MAIER, CFEL, University of Hamburg DESY — Discretizing Maxwell's equations in Galilean (comoving) coordinates allows to derive a pseudo-spectral solver that mitigates the numerical Cherenkov instability, in boosted-frame particle-in-cell simulations of laser-plasma acceleration. In this talk, we present a generalization of previous work on Galilean spectral solvers, by incorporating spatial derivatives of arbitrary order. This increases the locality of the solver, and thereby enables efficient parallelization by domain decomposition on many distributed compute units. The method is applied to typical boosted-frame simulations of laser-wakefield acceleration.

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