Abstract Submitted
for the GEC18 Meeting of
The American Physical Society

Future of High Performance Particle-in-cell codes computing JO-
HAN CARLSSON, Princeton Plasma Phys Lab — For electrostatic and implicit
electromagnetic Particle-in-cell (PIC) codes the global field solve of the Poisson, or
implicitly time-discretized Maxwell equations, requires massive communication that
limits scalability, especially for three-dimensional simulations. We will discuss best
practices, including algorithms and solver libraries. Results from scalability stud-
ies will be presented, with an emphasis on electrostatic PIC using the multi-grid
method to solve the Poisson equation. Example applications using large-scale sim-
ulationswill be presented. An extrapolation to future high-performance computers
will be attempted.

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Date submitted: 19 Jun 2018   Electronic form version 1.4