

Abstract Submitted
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New developments in algorithms and verification in the particle-in-cell code XGC¹ C.S. CHANG, S. KU, R. HAGER, PPPL, S. PARKER, Y. CHEN, E. YOON, U. Colorado Boulder, SCIDAC EPSI TEAM — Recent algorithm developments for electrostatic and electromagnetic simulations in the edge gyrokinetic code XGC1 will be reported, together with their verification activities. Topics to be discussed include Lagrangian-Eulerian hybrid algorithm, fully nonlinear multispecies Fokker-Planck collision algorithm, and implicit electromagnetic simulation algorithm. These developments enabled study of edge blobby turbulence, divertor heat-flux width, edge transport bifurcation, electromagnetic instabilities, RMP physics, etc. on extreme scale computers, which would have been difficult otherwise.

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