

The Beams and Applications Seminar Series

First Steps Towards a New Generation of High-Order Particle-In-Cell Methods for General Kinetic Plasma Applications

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**Bldg. 401, Rm. B2100
Monday, January 22, 1:30 pm
(Please Note Special Time and Place)
Host: Yong-Chul Chae, ASD**

Abstract: We shall discuss the ongoing development of a high-order accurate PIC method on unstructured grids. The field solver is based on a Discontinuous Galerkin (DG) scheme for the time-domain Maxwell equations. This ensures geometric flexibility through a fully unstructured grid at arbitrary order of accuracy enabling efficient and accurate modeling of multiscale phenomena. The particle mover is flexible in terms of particle shapes and a level set approach is employed to implement elastic/inelastic interactions with boundaries. Divergence control is done either through a fully hyperbolic Lagrange multiplier technique or using a classical Boris projection scheme. We shall illustrate the performance of the two-dimensional and three-dimensional algorithm through a few examples, e.g., plasma waves, Landau damping, magnetrons etc. Both non-relativistic and fully relativistic cases shall be considered as well as some simple magnetron cases with more complex geometries.....

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(kitching@aps.anl.gov, 630-252-6159) to arrange for a gate pass.