

High order structure preserving Generalized Finite Difference schemes for Particle In Cell simulations on structured grids

Friday, December 16, 2022 9:00 AM (45 minutes)

Semi-Discrete schemes for the Vlasov-Maxwell equations based on a Particle in Cell method combined with techniques from Finite Element Exterior Calculus yield a finite dimensional hamiltonian system which after time discretization with classical geometric numerical methods have very good long time properties and preserve exactly important invariants of the system. We will propose in this talk a generalized framework which can be used in particular to derived hamiltonian systems also with an appropriate Generalized Finite Difference Framework. A performance portable implementation of this scheme aimed at very large simulations will be presented.

Presenter: SONNENDRUCKER, Eric