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Particle-in-cell simulation codes in High Performance Fortran

Draft

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Abstract

We discuss the implementation of one- and two-dimensional electrostatic, relativistic Particle-in-Cell plasma simulation codes in High Performance Fortran. We describe commonly used particle and field grid decomposition methods in PIC codes, and discuss the implementation issues for each method. We specifically address the useful HPF features that ease the representation of the PIC codes in HPF and propose new language features and run-time support library extensions that would be beneficial in the implementation of PIC codes in HPF.

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