

Abstract Submitted  
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**Electromagnetic particle simulation with adaptive mesh refinement technique for analysis of multi-scale phenomena**<sup>1</sup> MASANORI NUNAMI<sup>2</sup>, YOSHIHIRO KAJIMURA, HIDEYUKI USUI, Research Institute for Sustainable Humanosphere, Kyoto University, IKU SHINOHARA, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency — We have developed a new electromagnetic particle code with adaptive mesh refinement (AMR) technique for numerical analysis of plasma phenomena which include multi-scale processes, for example, magnetic or inertial confinement plasma and space plasma and so on. The AMR technique is effective to simulate the phenomena which include local micro-scale processes and global macro-scale processes with high-resolution by subdividing and removing cells dynamically according to refinement criteria monitoring the characteristic length, for instance, Debye length. In development of the code, we have applied the AMR technique to particle-in-cell (PIC) method by using fully threaded tree structure [1] and parallelized the code by using Morton ordering method. [1] A. M. Khokhlov, J. Comput. Phys. 143, 519(1998).

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