

Abstract Submitted  
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**Adaptation of non-neutral plasma simulation for parallel-processing architecture** EVAN BALLARD, Brigham Young University — In the field of computational physics, the use of parallel-processing technology can often greatly decrease the time required to perform simulations. I am working to adapt an existing non-neutral plasma simulation to a parallel architecture in order to decrease run-time. It is hoped that this will allow longer and more precise simulation runs, as well as allow the incorporation of collisions with neutral particles into the simulation. I am working to minimize the overhead cost of communication between processors when collection and redistribution of data is necessary. The limiting step of the simulation has been identified as the particle mover, which calculates the movements of the charged particles in the electric field due to the Lorentz force. This step is easily done in parallel, so the simulation can be significantly increased in speed by the addition of processors until a step of the simulation that cannot be executed in parallel, such as the electric-field solver, becomes the limiting step. The adaptation of this simulation for parallel-processing will therefore greatly reduce running-time.

Evan Ballard  
Brigham Young University

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