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Grid-Free Electromagnetic Particle Simulations¹ BENJAMIN ONG, ANDREW CHRISTLIEB, Department of Math, Michigan State University, ROBERT KRASNY, Department of Math, University of Michigan — In this poster, we demonstrate how the existing boundary integral treecode (BIT) framework can be extended to electrodynamic problems. The key idea is a method of lines transpose methodology, where we choose to discretize in time and directly solve the resulting Helmholtz equation using an integral formulation. Using this formulation, the resulting implicit time integrator can be solved efficiently using treecode algorithms, and is able to take time steps much larger than the imposed CFL restrictions for a standard explicit integrator. Also, this method potentially recovers the magneto-static limit.

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