Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Computational Electromagnetics Post Processing Using 'MD-Grape' Board BRANDON MOMEYER, Allegheny College Department of Physics, GARY BEDROSIAN, Allegheny College Deptartment of Physics — The goal of Computational Electromagnetism (CEM) is to write and use computer codes to solve complex problems involving electric and magnetic fields. In CEM one can follow a three-step process: The first step is pre-processing, which involves building and generating a matrix equation from the electric and magnetic field properties. The second step is the solution to the matrix equation, which is solving for the unknown variable in the matrix equation. The final step is post-processing, which is to prepare numerical calculations from the results of the matrix and to create three-dimensional displays. The main focus in this study will be on the final step of the process. We are investigating whether a hardware accelerator board that was designed from problems in molecular dynamics and astrophysics, called MD_GRAPE, can be adapted to accelerate the numerical computations required for CEM post-processing. Several computer codes have already been developed that go through these steps, it is our goal to accelerate them using MD_GRAPE. We present results for post-processing 3D magnetic fields computed numerically using the finite element method (FEM).

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Date submitted: 01 Dec 2008 Electronic form version 1.4