

Abstract Submitted  
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**Hybrid Simulations of Mini Magnetospheres in the Laboratory** LUIS GARGATE, Instituto Superior Tecnico, Portugal, RUTH BAMFORD, ROBERT BINGHAM, Rutherford Appleton Laboratory, UK, RICARDO FONSECA, LUIS SILVA, Instituto Superior Tecnico, Portugal — We use a massively parallel 3D hybrid particle code, dHybrid, to simulate the deflection of plasma beams by a dipole like magnetic field in a laboratory environment. Dipole magnetic fields, along with a plasma injection source to inflate the magnetic field, are now being studied as means of deflecting solar wind and Energetic Particles away from spacecrafts [1,2,3]. We have considered three setups, consistent with the experiments, with a plasma beam fired at i) a dipole field with no plasma injection, ii) a plasma injection source with no dipole field and iii) a dipole field with a plasma injection source. The hybrid simulations help understand the relevant physical phenomena, and enable extrapolation to space plasma scenarios, where setups are similar but plasma parameters differ significantly. The simulation results consistently show the plasma beam being deflected by the dipole field, in the first scenario, with the deflecting distance determined by the magnetic field intensities. The other two scenarios are also studied via hybrid simulations and the main physical differences between setups are highlighted. Comparisons with experimental results are discussed. [1] D. Winske et al, Phys. Plasmas 12 (2005) [2] Hai-Bin Tang et al, Phys. Plasmas 14 (2007) [3] <http://www.ukssdc.ac.uk/twiki/bin/viewauth/Minimag/WebHome>

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