Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Hybrid simulations of coronal mass ejection shock structures LUIS GARGATE, RICARDO FONSECA, LUIS SILVA, GoLP/CFP, Instituto Superior Técnico, Portugal, ROBERT BINGHAM, Rutherford Appleton Laboratory, UK — Coronal mass ejections (CME's) are large scale solar events consisting of massive quantities of over-dense hot plasma that is ejected from the sun's streamer belt in a region known as the corona. CME's can travel at speeds up to 1000 km/s interacting with the slower solar wind and causing the formation of highly energetic ions due to wave particle interactions in the shock front. The actual acceleration mechanisms of the energetic ions are still under strong debate. The acceleration processes of solar energetic particle events due to CMEs are investigated. A 3D hybrid particle code, called dHybrid, is used to simulate the corona environment. Initial conditions are set in accordance with MHD models of the corona widely described in the literature. The simulation reveals the presence of shock like structures, being the source of SEPs. The acceleration mechanism of ions in the shocks is examined; the simulations indicate that surfatron acceleration is the mechanism responsible for the most energetic ions.

Luis Silva
GoLP/CFP, Instituto Superior Técnico, Portugal

Date submitted: 15 Jul 2005 Electronic form version 1.4