

Abstract Submitted
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SELF: Fast Ion Surface Energy Loss in the Wake Fields of Solid Foils GORDON BERRY, University of Notre Dame, TAPAN NANDI, KUMAR HARIS, Inter University Accelerator Center — We have measured the stopping powers of several fast, highly-ionized atoms passing through thin bi-layer targets made up of metals and non-conductors. We were surprised to find that the energy loss depends on the ordering of the target is significantly different on bi-layer reversal. We ascribe this new energy-loss (the SELF – the Surface Energy Loss Field) effect to the differing wake fields as the beam exits the target in the two cases. This finding is validated with several different bi-layer targets. Further, besides the highly charged ion beams, molecular ions also reveal similar results in the forward/backward coulomb explosions. We compare our energy loss results with those of previous theoretical predictions for the wake potential for fast ions in solids; lighter ions show better agreements: some theories show large discrepancies with our measurements. Further theoretical work is needed to better quantify our conclusions.

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