Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Improving the Dynamic Range of CR39 Detectors for ICF Experiments Through Multiple Track Overlap Detection Algorithms[1] A. ZYLSTRA, N. SINENIAN, M. MANUEL, H.G. RINDERKNECHT, M.J. ROSENBERG, D.T. CASEY, J.A. FRENJE, C.K. LI, F.H. SEGUIN, R.D. PETRASSO, MIT — CR39 based nuclear detectors are in widespread use for Inertial Confinement Fusion (ICF) experiments [1,2]. Current analysis methods only count scanned shapes of single tracks, limiting the standard dynamic range of the detector to approximately 100. We present simulations and experimental studies at the MIT accelerator of methods for accurately determining the total particle count when overlapping tracks are a non-negligible fraction of the total. Advancements in analysis algorithms to accurately count at higher track densities through these methods could significantly increase the dynamic range of CR39 based detectors at OMEGA and the NIF.

[1] F. H. Seguin et al., Rev. Sci. Instrum 74 (2003) 975.
[2] C.K. Li et al, Phys. Rev. Lett. 100, 225001 (2008).

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Date submitted: 15 Sep 2009

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