

Abstract Submitted  
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**Determining Light Decay Curves in a Plastic Scintillator using Cosmic Ray Muons**<sup>1</sup> PRAVEEN WAKWELLA, SARAH MANDANAS, JOHN WILSON, HANNAH VISCA, STEPHEN PADALINO, SUNY Geneseo, T. CRAIG SANGSTER, SEAN P. REGAN, Laboratory for Laser Energetics — Plastic scintillators are used in ICF research to measure neutron energies via their time of flight (nToF). The energy resolution and sensitivity of an nToF system is directly correlated with the scintillation decay time of the plastic. To decrease the decay time, some scintillators are quenched with oxygen. Consequently, they become less efficient at producing light. As time passes, oxygen defuses out of the scintillator this in turn increases light production and the decay time. Mono-energetic calibration neutrons produced at accelerator facilities can be used to monitor the decreased oxygen content, however this is a time consuming process and requires that the scintillators be removed from the ICF facilities on a regular basis. Here, a possible method for cross calibrating accelerator neutrons with cosmic ray muons is presented. This method characterizes the scintillator with accelerator-generated neutrons and then cross calibrates them with cosmic ray muons. Once the scintillators are redeployed at the ICF facility the oxygen level can be regularly monitored using muons in situ.

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