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Inertial Confinement Fusion as a Tool to Study Fundamental Nuclear Science TYLER KOWALEWSKI , SALVATORE FERRI, STEVEN RAYMOND , MARK YULY, Houghton College, STEPHEN PADALINO , State University of New York at Geneseo , CHAD FORREST, CRAIG SANGSTER, SEAN REGAN, Laboratory for Laser Energetics — Inertial confinement fusion may be used to make fundamental nuclear science measurements of low-energy light-ion cross sections also of interest in astrophysics and fusion research. The feasibility of collecting and counting the beta decay of the reaction products (half-life 20 ms to 20 s) in the expanding neutral gas after the ICF shot is being studied using a special vacuum system that allows gas to be released, trapped, and counted in-situ using different techniques. Initial experiments use a turbopump to trap the gas in the foreline, where it can be counted by a 4π phoswich beta detector. The construction of this detector and tests using ^{41}Ar gas produced via the ^{40}Ar(d,p)^{41}Ar reaction will be described, as well as an OMEGA laser ride-along experiment to measure background rates from milliseconds to seconds after the laser shot. Funded in part by a grant from the DOE through the Laboratory for Laser Energetics, and by SUNY Geneseo and Houghton College.

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