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A Fast Ionization Chamber for GODDESS R.T. LUMB, Tenn. Tech. U., A.S. LIPMAN, T. BAUGHER, J.A. CIZEWSKI, A. RATKIEWICZ, Rutgers, S.D. PAIN, ORNL, R.L. KOZUB, Tenn. Tech. U. — Transfer reactions are among the main methods used in nuclear physics to probe the structure of nuclei. Such information is needed to constrain nuclear models and to understand various nucleosynthesis processes. In many cases, the nuclear level densities are too high to be resolved in transfer reactions via charged particle detection alone. This problem and issues arising from contaminants in radioactive beams can be addressed by using particle-γ coincidence techniques along with heavy recoil identification in inverse kinematics. A device to accomplish these tasks is Gammasphere ORRUBA: Dual Detectors for Experimental Structure Studies (GODDESS),[1] currently being commissioned for the ATLAS facility at ANL. We are currently building a compact, tilted grid ionization chamber for GODDESS to detect and identify beam-like recoils near zero degrees in the lab. The tilt (30 degrees off normal to the beam) helps the ion pairs to be detected quickly, after drifting only a short distance away from the beam axis. This reduces the response time, allowing counting rates of $\sim$500,000/s.[2] The design and current status of the project will be presented. Research supported by the U. S. DOE.

[1]D. Pain, AIP Advances 4, 041015 (2014) and references therein.
[2]Pain (2014)

Raymond Kozub
Tennessee Technological University

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