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Developing a technique for measuring the fusion of neutron-rich nuclei at near barrier energies KYLE BROWN, M.J. RUDOLPH, Z.Q. GOSSER, S. HUDAN, R.T. DESOUZA, Indiana University, M. FAMIANO, Western Michigan University — Enhancement of the fusion cross-section for neutron-rich light nuclei has been postulated as a heat source that triggers X-ray superbursts in the crust of an accreting neutron star. To investigate this question, one has begun an experimental program to measure near-barrier fusion of ^{20,22}O ions incident with ^{12}C nuclei. Fusion in ^{16}O + ^{12}C provides a necessary reference reaction. While this reference reaction has already been extensively studied, measuring the excitation function with the same experimental setup used for radioactive beam experiments will allow us to both demonstrate the feasibility of the experimental technique, as well as account for experimental uncertainties. Near and sub-barrier fusion cross-sections were measured for ^{16}O + ^{12}C at Western Michigan University for 20 MeV $< E_{lab} <$ 31 MeV. The time-of-flight between two micro-channel plate detectors, spaced by approximately 80cm, allows selection of the incident particle's time-of-flight on an event-by-event basis. The carbon foil of the second MCP acts as the target and provides a start signal. Fusion residues are identified by energy and time-of-flight (δ = 425ps for E_α = 7.687 MeV) between the active target and two segmented, annular silicon detectors which cover the angular range, $3^\circ < \theta_{lab} < 20^\circ$. Results will be compared with established cross-sections.

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