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Studying a Potential Calibration Reaction for NIF B. VANDE KOLK, R.J. DEBOER, E. STECH, M. WIESCHER, University of Notre Dame — Measurements have been made for the reaction ^{10}B(p,γ)^{11}C. Investigating this is the first step in utilizing the reaction ^{10}B(p,α)^{7}Be as a potential calibration for the National Ignition Facility (NIF). NIF is able to create conditions within the same temperature range that exist during hydrogen burning in a star, a process by which nucleosynthesis occurs. Be-7 has a half-life of 53.2 days, long enough to gather and study before it decays but short enough to have decayed in several months, which makes its reaction a suitable candidate for calibration. There is a 10 keV resonance that dominates the low energy cross section of both ^{10}B(p,α)^{7}Be and the ground state ^{10}B(p,γ)^{11}C. In addition, a higher energy resonance at 600 keV is shared by both reactions. The two resonances interfere, as they have the same spin-parity 5/2+, and their levels are not constrained enough by data to allow for reliable extrapolation to the lower energies that correspond to the temperature range of NIF. The measurement of ^{10}B(p,γ)^{11}C is sensitive to the gamma partial width as well as the alpha width of these levels and will better determine these resonances, allowing for more confident extrapolation.

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