

Abstract Submitted
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Determination of Neutron Branching in $^{12}\text{C}+^{12}\text{C}$ Fusion¹ JUSTIN BROWNE, University of Notre Dame — The neutron branch of the $^{12}\text{C}+^{12}\text{C}$ is important for the carbon shell burning and carbon explosive burning. The ^{23}Mg created by the $^{12}\text{C}(^{12}\text{C},n)^{23}\text{Mg}$ reaction may undergo β^+ decay, changing the neutron excess in the combusting material, and the neutrons emitted from this reaction may contribute to s- and r-processes. Both the β^+ decay and the neutron emission greatly affect the subsequent nucleosynthesis in the star. A detection system, consisting of an array of four plastic scintillators and two Germanium detectors, has been developed to detect the decay of the ^{23}Mg . The system has been tested at $E_{c.m.} = 4.24\text{MeV}$. Using $\beta^+ - \gamma$ coincidence technique, the ^{23}Mg reaction products has been unambiguously identified.

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Justin Browne
University of Notre Dame

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