Abstract Submitted
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Examination of the validity of statistical models for the ^{12}C + ^{12}C fusion reaction at sub-barrier energies[1] ERIN DAHLSTROM, Rice University — Previous experimental studies of ^{12}C + ^{12}C fusion at sub-barrier energies using gamma spectroscopy have been limited by the use of a single detector. Use of the Gammasphere at the Argonne National Laboratory, however, allows for an array of germanium detectors to pick up the characteristic gamma rays, greatly increasing the information received. These decay products do not give us the total cross section for the fusion reaction though; we rely on statistical models that relate them to how the excited states are originally populated and decay. Using a combination of gamma spectroscopy based on data from the Gammasphere and proton spectroscopy from a recent ^{12}C + ^{12}C fusion experiment at Notre Dame, we tested these statistical models. The initial population of excited states for ^{23}Na predicted by Empire, a standard statistical model for the decay of different ^{24}Mg spins, was compared with the population determined from the gamma and proton spectroscopy. This comparison will potentially help us more accurately predict the spin population of ^{24}Mg, further constraining the fusion reaction theory.

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Erin Dahlstrom
Rice University

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