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Investigating the ^{38}K(p,γ)^{39}Ca reaction rate in novae via the energy levels of ^{39}Ca[1] MATTHEW HALL, Oak Ridge National Lab, DANIEL BARDAYAN, University of Notre Dame, TRAVIS BAUGHER, ALEX LEPAILLEUR, Rutgers University, STEVEN PAIN, Oak Ridge National Lab, ANDREW RATKIEWICZ, Lawrence Livermore National Lab, GODDESS COLLABORATION — While it is known that the endpoint of nucleosynthesis in nova explosions is around ^{40}Ca, discrepancies exist between the modeled and observed abundances of nuclei near the endpoint. Uncertainties in the ^{38}K(p,γ)^{39}Ca reaction rate could be one source of the discrepancy. Accurate calculation of the rate depends on knowledge of three $\ell = 0$ resonances, which correspond to $J^\pi = 5/2^+$ excited states in ^{39}Ca above the ^{38}K+p threshold. Gammasphere ORRUBA: Dual Detectors for Experimental Structure Studies (GODDESS) was used to study these excited states via the ^{40}Ca(^{3}He,α)^{39}Ca reaction at Argonne National Laboratory. Three excited states with energies of 6156.2(16), 6268.8(22), and 6470.8(19) keV were found by studying the γ-α coincidences in the measurement, corresponding to three suspected $J^\pi = 5/2^+$ states. Their impact on the ^{38}K(p,γ)^{39}Ca reaction rate was investigated and these results will be discussed.

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