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Investigation of High-Lying (π, π) Resonances in ^{22}Ne via High-Resolution Gamma Ray Spectroscopy in Inverse Kinematics

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In asymptotic giant branch (AGB) stars, ^{22}Ne plays an important role in several nucleosynthesis processes, with its production competing with the synthesis of ^{19}F through the so called 'poisoning reaction', and the following transfer into ^{25}Mg acting as the main neutron sources for the heavy element s-process, affecting the reaction rates of numerous isotopes.

In this contribution, we discuss a recent neutron transfer experiment done at TRIUMF in November 2018, directly populating ^{22}Ne , allowing for high resolution measurements of the resonance energies with the SHARC silicon detector, coupled to the HPGe detector array TIGRESS for accurate measurement of the characteristic gamma rays. We will then present the method of using the angular distribution of these newly measured gamma rays to determine the spins of the resonance states, allowing for further constraint on the reaction cross-section.

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