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Constraining the ^{30}P(p,γ)^{31}S reaction using ^{30}P(d,pγ)^{31}P with GODDESS[1] RAJESH GHIMIRE, University of Tennessee + Oak Ridge National Laboratory, STEVEN PAIN, Oak Ridge National Laboratory, KATE JONES, University of Tennessee, ANDREW RATKIEWICZ, Lawrence Livermore National Laboratory , JOLIE CIZEWSKI, CHAD UMMEL, HARRISON SIMS, GWENAELLE SEYMOUR, Rutgers University, GODDESS COLLABORATION — In classical nova nucleosynthesis, the ^{30}P(p,γ)^{31}S reaction rate critically affects the mass flow into the A=30-40 range, impacting the abundances of isotopes of phosphorus, sulfur and silicon. However, currently available ^{30}P beam intensities are insufficient to measure the (p,γ) reaction directly. The rate of this reaction depends on undetermined spectroscopic strengths of low-lying resonances in ^{31}S, located between 6 and 7 MeV in excitation. However, it is experimentally difficult to measure proton spectroscopic factors on unstable nuclei. We performed a ^{30}P(d,pγ)^{31}P neutron transfer reaction measurement using the newly commissioned GODDESS (Gretina-ORRUBA: Dual Detectors for Experimental Structure Studies) system with an 8 MeV/u ^{30}P beam, from RAISOR at ATLAS, in order to provide constraints on the spectroscopic strengths for ^{31}S levels via mirror symmetry. Details of the experiment and initial data analysis will be presented.

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