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Lifetime measurements to constrain the ^{30}P$(p,\gamma)^{31}$S rate at classical nova temperatures[1] CATHLEEN FRY, MSU/NSCL — Classical novae occur in binary star systems, where a white dwarf accretes hydrogen rich material from its companion star until it ignites in thermonuclear runaway. In this explosive scenario, the ^{30}P$(p,\gamma)^{31}$S reaction potentially acts as a bottleneck in nucleosynthesis flow to higher masses. Knowledge of this reaction rate is necessary for the modeling of elemental and isotopic ratios in classical novae, which affect proposed nova thermometers and presolar grain identification, respectively. This reaction rate is dominated by resonant capture, and while most of the resonance energies are known experimentally, the corresponding resonance strengths are not yet known. A measurement of the lifetimes of these states would provide the total widths of these resonances, and can be used along with the spins and proton branching ratios to determine resonance strengths. As a step towards determining experimental resonance strengths, we recently ran an experiment to measure the lifetimes of these resonances, using the Doppler Shift Lifetime (DSL) setup at TRIUMF. Challenges from this preliminary measurement and future plans will be discussed.

[1]On behalf of TRIUMF S1582 collaboration

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