Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Spin and parities of sub-threshold resonances and their interference effects in the ^{18}F destruction reaction ^{18}F(p,α)^{15}O[1] FEDERICO PORTILLO CHAVES, North Carolina State University, KIANA SETOODEHNIA, European X-ray Free Electron Laser GmbH, Schenefeld, Germany., CALEB MARSHALL, Ohio University, RICHARD LONGLAND, North Carolina State University
— The ^{18}F(p,α)^{15}O reaction dominates ^{18}F destruction in classical nova explosions. However, uncertainties in its cross section at low energy place a poor constraint on the ^{18}F abundances predicted by nova models. The incomplete knowledge of the interference effects between broad resonances (e.g. at E_{CM} = 665 keV) and those near the proton-threshold constitutes an important source for these uncertainties. Accurately determining resonance parameters such as energies, spin and parities (J^π), and widths of sub-threshold and unbound states is crucial to study these interference effects. In this talk we will present the results of a ^{20}Ne(^{3}He,α)^{19}Ne neutron pickup reaction performed at the Triangle Universities Nuclear Laboratory using its Enge split-pole magnetic spectrograph. In particular, we will show results of the analysis done to determine the J^π of the 6.290 MeV state (E_{CM} -120 keV resonance). Also, we will present the results for the 6.132 MeV state (E_{CM}= -278 keV) together with other states of astrophysical interest, and highlight their effect on the ^{18}F(p,α)^{15}O reaction rate at nova temperatures.

[1]U.S. Department of Energy, Grant No. DE-SC0017799 and Contract No. DE-FG02-97ER41041

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Date submitted: 07 Jan 2021 Electronic form version 1.4