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Near proton threshold interference effects in the 18F destruction reaction 18F(p,)15O FEDERICO PORTILLO CHAVES, North Carolina State University, Triangle Universities Nuclear Laboratory, KIANA SETOODEHNIA, European X-ray Free Electron Laser GmbH, Schenefeld, Germany., CALEB MARSHALL, RICHARD LONGLAND, North Carolina State University, Triangle Universities Nuclear Laboratory — Predictions of ^{18}F in classical nova explosions depend on the cross section of the ^{18}F(p,α)^{15}O reaction. Uncertainties in this cross section currently place a poor constraint on ^{18}F production, and hence on the 511-keV gamma rays expected to be observed from its decay in the nova ejecta. An important source of these uncertainties comes from the incomplete knowledge of the interference effects between broad resonances (e.g. at E_{CM} = 665 keV) and those near the proton-threshold. In order to understand these interference effects it is very important to accurately know the energies, spin and parities (J^π), and the widths of sub-threshold and unbound states. 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. By using its Enge Split-pole Spectrograph facility we obtained the energy and J^π of states in the compound nucleus (^{19}Ne) most relevant for nova nucleosynthesis. In particular, we found that the sub-threshold states at 6.132 MeV and 6.290 MeV have J^π=$3/2^+$ and $7/2^+$, respectively. We will present our experimental results and highlight their effect on the ^{18}F(p,α)^{15}O reaction rate.

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