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First experimental constraints on the interference of $\frac{3}{2}^+$ resonances in the ^{18}F(p,α)^{15}O reaction[1] K.Y. CHAE, Univ. of TN, D.W. BARDAYAN, J.C. BLACKMON, M.S. SMITH, ORNL, M.W. GUIDRY, C.D. NESARAJA, Univ. of TN, ORNL, D. GREGORY, R.L. KOZUB, S. PAULAUSKAS, J.F. SHRINER JR., N. SMITH, TN Tech Univ., M.S. JOHNSON, ORAU, R.J. LIVESAY, M. PORTER-PEDEN, CO School of Mines, Z. MA, Univ. of TN, S.D. PAIN, J.S. THOMAS, Rutgers Univ. — The ^{18}F(p,α)^{15}O reaction plays a crucial role in understanding γ-ray emission from novae. Because of the importance of understanding the ^{18}F + p reactions, a number of studies of the A=19 isobars have been made using stable and exotic beams. The interference effects among $J^\pi = \frac{3}{2}^+$ resonances in the $^{18}F + p$ system, however, have never been measured, but they can change the S-factor by a factor of 20 at nova energies. R- matrix calculations indicate that the cross sections above the $E_{c.m.}$ = 665 keV resonance are sensitive to the interference between the $E_{c.m.}$ = 8, 38, and 665 keV resonances. In order to study the interference effects, an excitation function for the ^{1}H(^{18}F,α)^{15}O reaction has been measured in the energy range of $E_{c.m.}$ = 663-877 keV using radioactive ^{18}F beams at the Holifield Radioactive Ion Beam Facility. By measuring the ^{18}F(p,α)^{15}O cross section off resonance and comparing the cross section with theoretical calculations, we could provide the first experimental constraints on the interference of $\frac{3}{2}^+$ resonances.

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