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**First experimental constraints on the interference of  $\frac{3}{2}^+$  resonances in the  $^{18}\text{F}(p,\alpha)^{15}\text{O}$  reaction**<sup>1</sup> 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  $^{18}\text{F}(p,\alpha)^{15}\text{O}$  reaction plays a crucial role in understanding  $\gamma$ -ray emission from novae. Because of the importance of understanding the  $^{18}\text{F} + p$  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  $^{18}\text{F} + p$  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  $^1\text{H}(^{18}\text{F},\alpha)^{15}\text{O}$  reaction has been measured in the energy range of  $E_{c.m.} = 663\text{-}877$  keV using radioactive  $^{18}\text{F}$  beams at the Holifield Radioactive Ion Beam Facility. By measuring the  $^{18}\text{F}(p,\alpha)^{15}\text{O}$  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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Prefer Oral Session  
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