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First Direct Measurement of the Resonant ^{17}F(p,γ)^{18}Ne Reaction Rate[1] K.A. CHIPPS[2], Rutgers University, RIBENS COLLABORATION — Of significant importance in astrophysical events like novae and x-ray bursts is the rate of the ^{17}F(p,γ)^{18}Ne reaction, where it contributes to element synthesis and energy generation. It is crucial for the production of radioactive ^{18}F in such scenarios, which is a target of gamma-ray telescopes like GLAST and INTEGRAL. However, the ^{17}F(p,γ)^{18}Ne reaction rate had not been determined experimentally. A 3^+ state in ^{18}Ne predicted to dominate the rate was found at 599.8 keV using the ^{17}F(p,p)^{17}F reaction, but the resonance strength, which is directly related to the reaction rate, remained unknown. For the first time, the ^{17}F(p,γ)^{18}Ne reaction has been measured directly with the Daresbury Recoil Separator, using a mixed beam of radioactive ^{17}F and stable ^{17}O from the Holifield Radioactive Ion Beam Facility at Oak Ridge National Laboratory. A resonance strength and γ partial width for the 599.8 keV resonance was deduced, as well as an upper limit on the direct capture cross section at an energy of 800 keV. These results have been used to calculate a new reaction rate in the temperature range of interest, and the preliminary implications of this new, faster rate will be discussed.

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