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Measurement of the $^{17}O(p,\gamma)^{18}F$ nuclear reaction cross section in the energy range E_{lab} = 360 - 1625 keV ANTONIOS KONTOS, JOACHIM GÖRRES, ANDREAS BEST, QIAN LI, DANIEL SCHÜRMANN, ED STECH, ETHAN UBERSEDER, MICHAEL WIESCHER, University of Notre Dame, GIANLUCA IMBRIANI, Universita di Napoli, RICHARD AZUMA, University of Toronto — The $^{17}O(p,\gamma)^{18}F$ reaction influences hydrogen-burning nucleosynthesis in several stellar sites, such as red giants, asymptotic giant branch (AGB) stars, massive stars and classical novae. In the relevant temperature range for these environments (T_9 = 0.01-0.4), the main contributions to the rate of this reaction are the direct capture process, two low lying narrow resonances (E_R^{lab} = 70 and 193 keV) and the low energy tails of two broad resonances (E_R^{lab} = 587 and 714 keV). Previous measurements and calculations give contradictory results for the direct capture contribution which in turn increases the uncertainty of the reaction rate. In addition, very few published cross section data exist for the high energy region that might affect the interpretation of the direct capture and the broad resonances contributions in the lower energy range. In this work we present a measurement of the reaction at a wide proton energy range (E_{lab} = 360 - 1625 keV) and at several angles ($\theta_{lab} = 0^\circ, 45^\circ, 90^\circ, 135^\circ$). All detected primary transitions and all angles were fitted simultaneously and extrapolated to lower energies using the multi-level, multi-channel R-matrix code, *AZURE*.

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