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Measurement of the reactions ^{17}O$(\alpha,\gamma)^{21}$Ne and ^{17}O$(\alpha,$ n$)^{20}$Ne and their impact on the weak s process[1] A. BEST, J. GÖRRES, M. BEARD, M. COUDER, R. DEBOER, S. FALAHAT, R.T. GÜRAY, A. KONTOS, K.-L. KRATZ, P.J. LEBLANC, Q. LI, S. O'BRIEN, N. ÖZKAN, K. SONNABEND, R. TALWAR, W. TAN, E. UBERSEDER, M. WIESCHER, University of Notre Dame — The ratio of the reaction rates of the competing channels ^{17}O$(\alpha,\gamma)^{21}$Ne and ^{17}O$(\alpha,$ n$)^{20}$Ne determines the efficiency of ^{16}O as a neutron poison in the weak s process in low metallicity stars. It has a large impact on the element production, either producing elements to the mass range of A=90 in case of a significant poisoning effect or extending the mass range up to the region of A=150 if the γ channel is of negligible strength. We present results of the first measurement of the reaction ^{17}O$(\alpha,\gamma)^{21}$Ne and an improved study of the reaction ^{17}O$(\alpha,$ n$)^{20}$Ne, including an independent measurement of the ^{17}O$(\alpha,$ n$_1)^{20}$Ne channel, enabling a simultaneous R-Matrix fit to both the n$_0$ and the n$_1$ channels. The new data were used as input for stellar network calculations and their impact on the weak s process is discussed.

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