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A Study of the ^{13}C(α,n) Reaction Rate Through the ANC Technique ERIC JOHNSON, GRIGORY ROGACHEV, LAGY BABY, WARREN CLUFF, AMY CRISP, ERIC DIFFENDERFER, BERT GREEN, TRISHA HINNERS, CALEM HOFFMAN, KIRBY KEMPER, OLEXANDER MOMOTYUK, PATRICK PEPLOWSKI, AKIS PIPIDIS, ROB REYNOLDS, BRIAN ROEDER, Florida State University, AKRAM MUKHAMEDZHANOV, V. GOL'DBERG, Texas A&M University, SIMON BROWN, The University of Surrey — The ^{13}C(α,n) reaction is the main source of neutrons for the s-process. Currently the adopted rate has an uncertainty of $\sim$300%[C. Angulo et al., Nucl. Phys. A656, 3 (1999)] at the relevant stellar temperatures($\sim 10^8$ K). This leads to a large uncertainty in the modeling of AGB stars, which is where the s-process occurs. Recently, we measured the ANC of the $1/2^+$, 6.356 MeV, near threshold state in ^{17}O. This was done via the α-transfer reaction ^{13}C(^{6}Li,d)^{17}O($1/2^+$, 6.356) at sub-Coulomb energies. Using this information we were able to calculate the contribution of the $1/2^+$ state to the astrophysical S-factor. From our S-factor curve we calculated that the ^{13}C(α,n) reaction rate is reduced by a factor of 3, also the associated uncertainty is improved to $\sim$15%[E.D. Johnson et al., currently under review with PRL].

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