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12B(n,g) - The Influence on r-process Nucleosynthesis of Light Elements[1] H.Y. LEE, C.L. JIANG, R.C. PARDO, K.E. REHM, J.P. SCHIFFER, Argonne National Laboratory, N.J. GOODMAN, J.C. LIGHTHALL, S.T. MARLEY, A.H. WUOSMAA, Western Michigan University, M. NOTANI, X. TANG, University of Notre Dame, JINA, N. PATEL, Colorado School of Mines — Astrophysical models predict enhanced abundances for heavy elements produced in the r-process by extending the reaction network to include light, neutron-rich nuclei (Z$\leq$10). The independent study in search for the most influential reactions producing the final r-process abundances emphasize the importance of improved experimental data, especially for (n,γ) reaction rates with unstable nuclei. Based on this analysis, ^{12}B(n,γ)^{13}B is found to be one of most important light-mass nuclear reactions. We have measured the (d,p) reaction with radioactive ^{12}B beam for the first time using the ATLAS in-flight facility at Argonne. The spectroscopic factors determined from this measurement will be used to compare to theoretical calculations and the astrophysical implications using experimentally determined reaction rates will be discussed.

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