

Abstract Submitted  
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**Measurement of the plasma astrophysical S factor for the  ${}^3\text{He}(\text{d}, \text{p}){}^4\text{He}$  reaction in exploding molecular clusters** M. BARBUI, Cyclotron Institute, TAMU, TX, W. BANG, University of Texas at Austin, TX, A. BONASERA, Cyclotron Institute, TAMU, TX, J.B. NATOWITZ, Cyclotron Institute TAMU, TX, K. HAGEL, K. SCHMIDT, R. BURCH, G. GIULIANI, H. ZHENG, M. BARBARINO, Cyclotron Institute, TAMU, TX, G. DYER, H.J. QUEVEDO, E. GAUL, A.C. BERNSTEIN, M. DONOVAN, T. DITMIRE, University of Texas at Austin, TX, S. KIMURA, M. MAZZOCCO, INFN, Italy, F. CONSOLI, R. DE ANGELIS, P. ANDREOLI, ENEA, Italy — The plasma astrophysical S factor for the  ${}^3\text{He}(\text{d}, \text{p}){}^4\text{He}$  fusion reaction was measured for the first time at temperatures of few keV, using the interaction of intense ultrafast laser pulses with molecular deuterium clusters mixed with  ${}^3\text{He}$  atoms. Different proportions of  $\text{D}_2$  and  ${}^3\text{He}$  or  $\text{CD}_4$  and  ${}^3\text{He}$  were mixed in the gas jet target in order to allow the measurement of the cross-section for the  ${}^3\text{He}(\text{d}, \text{p}){}^4\text{He}$  reaction. The yield of 14.7 MeV protons from the  ${}^3\text{He}(\text{d}, \text{p}){}^4\text{He}$  reaction was measured in order to extract the astrophysical  $S$  factor at low energies. Results of the experiment performed at the Center for High Energy Density Science at The University of Texas at Austin will be presented [PRL, 111, 082502].

Joseph B. Natowitz  
Cyclotron Institute TAMU

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