

Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Cross-section measurement of ${}^7\text{Be} + d$ and ${}^7\text{Li} + d$ with ANASEN* and its implication in the Big Bang Nucleosynthesis.¹ NABIN RIJAL, INGO WIEDENHOVER, L. T. BABY, Florida State University, J. C. BLACKMON, Louisiana State University, G. ROGACHEV, Texas AM University — Astrophysically observed ${}^7\text{Li}$ is 3 – 4 times less than predicted amount by current models of Standard Big Bang Nucleosynthesis (SBBN). The nuclear reaction ${}^7\text{Be} + d$ at energies relevant to SBBN, has been discussed as a possible means to destroy mass-7 nuclei. We investigated the ${}^7\text{Be} + d$ and its mirror nuclear reaction ${}^7\text{Li} + d$ at SBBN energies using a radioactive ${}^7\text{Be}$ and stable ${}^7\text{Li}$ beam both in deuterium gas target inside ANASEN at Florida State University. ANASEN is an active target detector system which tracks the charged particles using a position sensitive proportional counter and 24-SX3 and 4-QQQ position sensitive Silicon detectors, all backed up by CsI detectors. ANASEN has wide angular coverage. The experiment measures a continuous excitation function by slowing down the beam in the target gas down to zero energy by using a single beam energy. Our set-up provides a high detection efficiency for all relevant reaction channels including (d, p) , (d, α) and/or direct breakup that can destroy mass-7 nuclei in contrast to previous measurements. The preliminary results of these experiments along with details of ANASEN detector will be presented. *ANASEN: Array for Nuclear Astrophysics and Structure with Exotic Nuclei.

¹This work is supported by the US NSF MRI program, grant no. PHY-0821308 and NSF Grant PHY-1401574.

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Date submitted: 18 Sep 2017

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