Cross-section measurement of $^7$Be$+d$ and $^7$Li$+d$ with ANASEN* and its implication in the Big Bang Nucleosynthesis. NABIN RIJAL, INGO WIEDENHOVER, L. T. BABY, Florida State University, J. C. BLACKMON, Louisiana State University, G. ROGACHEV, Texas AM University — Astrophysically observed $^7$Li is 3 – 4 times less than predicted amount by current models of Standard Big Bang Nucleosynthesis (SBBN). The nuclear reaction $^7$Be$+d$ at energies relevant to SBBN, has been discussed as a possible means to destroy mass-7 nuclei. We investigated the $^7$Be$+d$ and it’s mirror nuclear reaction $^7$Li$+d$ at SBBN energies using a radioactive $^7$Be and stable $^7$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 $(d, p)$, $(d, \alpha)$ 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.

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