Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Mass-7 destruction through $^7$Be + $d$ and $^7$Li + $d$ reactions, studied with ANASEN.\textsuperscript{1} NABIN RIJAL, INGO WIEDENHOVER, L.T. BABY, M. ANASTASIOU, J.J. PARKER, Florida State Univ, J.C. BLACKMON, K.T. MACON, D.S. GONZALEZ, Louisiana State University, E. KOSHCHIY, G. ROGACHEV, Texas AM University, J. BELARGE, A. KUCHERA, National Superconducting Cyclotron Lab, MSU — The astrophysically observed amount of $^7$Li is only 25%-33% of the one predicted by current models of Standard Big Bang Nucleosynthesis (SBBN). However, nuclear reactions between $^7$Be + $d$ are not well constrained experimentally and can destroy a good fraction of mass-7 nuclei under the conditions of SBBN. At the FSU accelerator laboratory, we performed a measurement of reactions between a beam of the radioactive isotope $^7$Be and the pure deuterium gas target located inside ANASEN (Array for Nuclear Astrophysics Studies with Exotic Nuclei). ANASEN is an active target detector system which tracks the charged particles between a position-sensitive proportional counter and 28 position-sensitive Silicon detectors, all backed up by CsI scintillation detectors. The experiment measures a continuous excitation function by slowing down the beam in the target gas, with a high detection efficiency for all relevant reaction channels, using single beam energy. We also performed an experiment for the mirror nuclear reaction $^7$Li + $d$ with ANASEN in active gas target mode. The preliminary results of these experiments along with details of ANASEN will be presented.

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

Nabin Rijal
Florida State Univ

Date submitted: 17 Jun 2016

Electronic form version 1.4