

The First Experiments with ANASEN

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The Array for Nuclear Astrophysics Studies with Exotic Nuclei (ANASEN) is a new active target detector designed for direct and indirect measurements of the key astrophysical nuclear reaction rates and to study structure of exotic nuclei using rare isotope beams. The main components of ANASEN are the cylindrical array of position sensitive silicon detectors backed by CsI(Tl) scintillator detectors and the position sensitive array of gas proportional counters with carbon fiber anode wires. The same gas is used as a target and as an active volume for the gas proportional counters.

The first experiments with ANASEN were performed at John. D. Fox Superconducting Linear Accelerator Laboratory at Florida State University. Rare isotope beam facility RESOLUT was used to produce beams of ${}^6\text{He}$, ${}^8\text{B}$, ${}^{17}\text{F}$ and ${}^{19}\text{O}$ ions. Excitation functions for ${}^6\text{He}+\alpha$, ${}^8\text{B}+p$ and ${}^{17}\text{F}+p$ elastic scattering were measured in the broad range of energies. These experiments were designed to study structure of ${}^{10}\text{Be}$ (focusing on clustering phenomena in this nucleus), ${}^9\text{C}$ and ${}^{18}\text{Ne}$. The structure of ${}^{20}\text{O}$ nucleus was studied using the ${}^{19}\text{O}(\text{d},\text{p})$ reaction. Overview of the results from these first experiments with ANASEN will be presented.

The ANASEN project is a collaboration between Florida State University and Louisiana State University. It is funded by the NSF Major Research Instrumentation grant.