

The Pelletron-Linac Neutron Wall

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In this work, we will report on the design, construction and performance of the neutron wall array installed at the Pelletron-Linac laboratory. One of the foreseen applications of this detector is to study nuclear reactions of astrophysical interest involving neutron exit channels. Neutral particle correlations can also be studied due to its large acceptance. The detector consists of two walls, each composed of 24 pyrex cells filled with the liquid organic scintillator BC-501A. Two photomultipliers were installed at both ends of each cell. The area of each wall is $2 \times 2 \text{ m}^2$ and the inactive area is less than 12% of the total area. Detectors with the same geometry are used in the National Superconducting Cyclotron Laboratory - Michigan State University (MSU). The detector is able to give information about the energy and the angle of the incident neutron using time of flight technique. It is also able to discriminate between gamma-ray and neutron signals for energies above 3MeV using the method of pulse-shape discrimination. In this poster we will present some preliminary results from the measurement of the ${}^7\text{Li}(p,n){}^7\text{Be}$ reaction used to evaluate the detector performance. This reaction is very well known and this data will provide important insights on detector operation and performance.