

Current Status of $S\pi$ RIT Time-Projection Chamber Project

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The SAMURAI Pion-Reconstruction and Ion-Tracker ($S\pi$ RIT) has recently been constructed at Michigan State University as part of an international effort to constrain the symmetry-energy term in the nuclear Equation of State (EoS). The $S\pi$ RIT-TPC is designed for measurements of the density dependence of the symmetry-energy term at around twice the saturation density. This study will be performed in the SAMURAI spectrometer at the Radioactive Isotope Beam Factory (RIBF) at RIKEN by measuring yield ratios for pions and other light isospin observables from central collisions of neutron-rich ions, such as $^{132}\text{Sn} + ^{124}\text{Sn}$. The $S\pi$ RIT-TPC was designed to fit inside the SAMURAI spectrometer, and thus has an overall design height of 742 mm, with a vertical drift length of 500 mm in the detection volume. The installation of the TPC into the spectrometer has been successfully tested in the summer of 2014, and an operational test was performed using the magnetic field. Signals from cosmic rays were multiplied with a multi-wire anode and image charges from this multiplication were read out on portions of the 12096 channel pad-plane using the recently developed Generic Electronics for TPCs. Significant progress has been achieved for the $S\pi$ RIT-TPC experiment, and preparations continue to move forward. The current status of the $S\pi$ RIT-TPC project will be presented in this talk. This material is based on work supported by the DOE under Grant No. DE-SC0004835, NSF under Grant No. PHY-1102511 and the Japanese MEXT Grant-in-Aid for Scientific Research on Innovative Area Grant No. 24105004

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