

First experiments with the SPIRIT-TPC

M. Karata, Nishimura¹, J. Barney², G. Cerizza², J. Estee², T. Isobe¹, G. Jhang³, M. Kaneko⁴, P. Lasko⁵, J. Lee³, J. Lukasi⁵, W.G. Lynch¹, A. McIntosh⁶, T. Murakami⁴, P. Pawlowski⁵, K. Pelczar⁵, H. Sakurai¹, C. Santamaria², R. Shane², D. Suzuki¹, S. Tangwanchaoen², M.B. Tsang², Yan Zhang⁷, and the SpiRIT collaboration

¹ RIKEN Nishina Center, RIKEN, Japan

² Department of Physics and Astronomy, and National Superconducting Cyclotron Laboratory, Michigan State University, USA

³ Department of Physics, Korea University, Republic of Korea

⁴ Department of Physics, Kyoto University, Japan

⁵ Institute of Nuclear Physics, PAN, Krakow, Poland

⁶ Cyclotron Laboratory, Texas A&M University, College Station, Texas, USA

⁷ Department of Physics, Tsinghua University, Beijing, China

The SAMURAI Pion-Reconstruction and Ion-Tracker Time-Projection Chamber (SPiRIT-TPC) project aims to constrain the symmetry energy term in the nuclear-matter equation of state (EOS) at super-saturation density. The TPC rectangular field cage of dimensions 86(W)x134(L)x50(H) cm³ is designed to be used inside the SAMURAI dipole magnet. 12096 pad signals are read out with the Generic Electronics for the TPC (GET).

Due to the event size and the large amount of data, central collision events are selected with three types of trigger arrays composed of plastic scintillators read by MPPCs. (1) KATANA_veto is placed near the exit window of the TPC to reject the non reaction beam particles and very peripheral reactions. (2) Two multiplicity trigger arrays are placed on both sides of the TPC to select central reaction events. (3) An Active Veto array are mounted 22 cm in front of the target to reject beam particles not hitting the target.

After a successful commissioning run in April, the first two physics experiments to measure the isospin multiplex ratios, π^+/π^- , n/p , $t/3\text{He}$ of $^{108}\text{Sn}+^{112}\text{Sn}$ (proton rich) and $^{132}\text{Sn}+^{124}\text{Sn}$ (neutron rich) reactions. are scheduled at RIKEN-RIBF-SAMURAI in May. Preliminary results obtained from these two experiments especially the performance of the TPC and the effectiveness of the trigger to select central collisions will be presented in this talk.

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