

Photogrammetry measurements of the SpiRIT TPC

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The SAMURAI Pion-Reconstruction and Ion-Tracker (SpiRIT), a Time Projection Chamber (TPC), is designed for measurements of the density dependence of the nuclear symmetry energy around twice the saturation density. This TPC will be used inside the large SAMURAI dipole magnet in the Rare Isotope Beam Facility (RIBF) in RIKEN Wako, Japan. To understand the relative locations of the TPC drift volume, with respect to the enclosure of the TPC, the dipole, and other auxiliary detectors, we use a calibrated camera system from Geodetic in which multiple photographs can be reconstructed into a 3-dimensional coordinate system to make 3D measurements of the SpiRIT TPC. This measurement technique known as photogrammetry is accurate to <100 micrometers and commonly used in SAMURAI experiments [2]. In this talk, I will describe the precise measurements and the uncertainties in mapping various TPC components in the magnet chamber using the photogrammetry technique.

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[1] R. Shane et al., Nucl. Instrum. and Meth. A (accept for publication)

[2] H.Otsu, et. al., RIKEN accelerator progress report vol. 46 (2013) 149.

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