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Inferring Neutron star properties with SpiRIT heavy-ion collision experiment. CHUN YUEN TSANG, Michigan State University, MANYEE BETTY TSANG, WILLIAM LYNCH, JON BARNEY, JUSTIN ESTEE, GENIE JHANG, NSCL, RENSHENG WANG, NCSL, TADAAKI ISOBE, Riken , MASANORI KANEKO, Kyoto University, MIZUKI KURATA-NISHIMURA, Riken, JUNG WOO LEE, Korea University — The material that Neutron star (NS) composes of is similar to the overlap region created temporarily from the collisions of heavy ions because they are both described by the same nuclear Equation of State (EoS). Therefore, studying compressed heavy ions is beneficial to our understanding of NS properties, such as the mass-radius relation of NS and the gravitational waveform of NS merger event such as GW170817 from LIGO/VIRGO collaboration. In particular, the ratio of the amount of π- to π+ fragments (π- /π+) created as the compressed heavy ions disintegrates is strongly sensitive to the curvature parameter Lsym of nuclear EoS, which in-turn is strongly sensitive to NS properties. To this end, we performed the SpiRIT experiment in which radioactive ^{132}Sn & ^{108}Sn isotopes are generated and accelerated to relativistic speed by Rare Isotope Beam Factory (RIBF) in RIKEN, and are set to collide with stationary ^{124}Sn & ^{108}Sn targets respectively. The collision compresses the nucleus to higher density before they disintegrate into fragments. The amount and momentum of pion fragments are measured with SAMURAI Pion Reconstruction and Ion Tracker (SpiRIT) Time Projection Chamber (TPC) immediately downstream of the target. In this talk, I will present a Bayesian analysis of the data with a transport quantum Molecular Dynamic model to constrain the EoS parameters.

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