Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Neutron-Proton equilibration in dynamically deformed nuclear systems. ALIS RODRIGUEZ MANSO, A.B. MCINTOSH, Cyclotron Institute, Texas AM University, A. JEDELE, S.J YENNELLO, Cyclotron Institute, Chemistry Department, Texas AM University — Understanding the nuclear Equation of State (nEoS) is fundamental for describing nuclear reaction dynamics, understanding the origin of the elements and characterizing the structure of neutron stars. The density dependence of the asymmetry energy still represents the largest uncertainty in the nEoS. We demonstrate a new time-sensitive method for studying reaction dynamics that may allow new types of constraints on the asymmetry energy. We study neutron-proton equilibration in dynamically deformed nuclear systems by investigating the correlations between the largest fragments produced in collisions of ^{70}Zn +^{70}Zn, ^{64}Zn +^{64}Zn, ^{64}Ni +^{64}Ni and ^{70}Zn +^{64}Zn at 35 MeV per nucleon measured at the Cyclotron Institute at Texas A&M University. The extent of equilibration is investigated using the rotation angle as a clock. The equilibration follows an exponential trend with consistent rate constants across a wide variety of reaction partners and systems, indicating the equilibration follows first order kinetics. The statistical and dynamical components are separated on average; the equilibration curve for the purely dynamical is consistent with the overall equilibration curve, indicating the robustness of the method to statistical contamination.

Alis Rodriguez Manso
Cyclotron Institute, Texas A
M University

Date submitted: 30 Sep 2016 Electronic form version 1.4