Abstract Submitted
for the APR14 Meeting of
The American Physical Society

Learning about the nuclear symmetry energy through the lens of isospin transport ROMUALDO DESOUZA, SYLVIE HUDAN, KYLE BROWN, Indiana University Bloomington/Center for Exploration of Energy and Matter — Examining nucleon transport between nuclei in intermediate energy heavy-ion collisions is an effective means to assess the density dependence of the nuclear symmetry energy. Overlap of the Fermi tails of the two nuclei as they collide provides a density gradient that drives nucleon transport. In addition, nucleon transport is driven by gradients in N/Z. Disentangling these two contributions provides a measure of the symmetry energy and its density dependence and requires a comparison of N/Z symmetric and asymmetric systems. To address this question we have examined semi-peripheral collisions of ^{64}Zn ions with ^{64}Zn, ^{209}Bi, and ^{27}Al targets at E_{lab} = 45 MeV/A. The projectile-like fragment emerging from these collisions frequently undergoes binary decay in a dynamical fission process. By using the rotation of the projectile-like fragment as a clock, it is deduced that N/Z equilibration persists up to 1200 fm/c. As prior measurements were restricted to timescales of less than 100 fm/c, this approach represents a dramatic improvement in the sensitivity to long timescales. This work is supported by the U.S. DOE under Grant No. DEFG02-88ER-40404.

Romualdo deSouza
Indiana University Bloomington/Center for Exploration of Energy and Matter

Date submitted: 10 Jan 2014 Electronic form version 1.4