Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Multinucleon Transfer Reactions in the TDHF Framework[1] KYLE GODBEY, Texas A&M University, CEDRIC SIMENEL, The Australian National University, SAIT UMAR, Vanderbilt University — At the center of efforts to understand the rapid neutron capture process, the structure of exotic nuclei, and quantum equilibration processes lies the fundamental problem of synthesizing neutron-rich nuclei. Multinucleon transfer (MNT) reactions in particular are well positioned to probe the neutron-rich region and has been the subject of extensive study in recent years. Out of the many approaches available to study MNT reactions, the time-dependent Hartree-Fock (TDHF) method paired with the time-dependent random phase approximation (TDRPA) extension has been used to great effect to reproduce experimental results and as a predictive tool. In this presentation we give an overview of TDHF+TDRPA calculations and their recent application to ^{176}Yb+^{176}Yb symmetric collisions[2]. Scattering and equilibration features of the system were systematically investigated with a primary goal being to provide experimental guidance and probe the limits of the theoretical approach. The viability of the system as a generator for neutron-rich nuclei is also explored in addition to laying the groundwork for future studies that are possible within this framework.

[1]Supported by U.S. DOE NNSA Grant No. DE-NA0003841, U.S. DOE grant No. DE SC0013847, and by the Australian Research Councils Grant No. DP190100256.
[2]K. Godbey, C. Simenel, and A. S. Umar, Phys. Rev. C 101, 034602 (2020)

Kyle Godbey
Texas A&M University

Date submitted: 25 Jun 2020 Electronic form version 1.4