DNP20-2020-000411

Abstract for an Invited Paper
for the DNP20 Meeting of
the American Physical Society

Structure, Reactions, and Effective Interactions[1]

CHARLOTTE ELSTER, Ohio University

It is a particular exciting time for rare isotope science. As FRIB is coming online, the physics community prepares to address the challenging science. A large fraction of the FRIB program will involve direct reactions with rare isotope beams, reactions, which leave a good part of the beam nuclei intact. Thus, the theory of nuclear reactions is central to understanding experiments at FRIB. Reliable and quantifiable prediction of reactions with rare isotopes will play a major part in the FRIB-centered theory effort. Over the last decade tremendous progress has been in made in *ab initio* calculations of nuclear structure as well as in the description of nuclear few-body systems. The expertise gained in both of these areas will be essential to face the challenge in describing nuclear reactions with rare isotopes. An essential part of connecting nuclear structure developments with reaction approaches is deriving and understanding the effective interactions that enter reaction calculations. This presentation will highlight a few examples that illustrate the need for the synergy of few- and many-body theory to address challenges posed by nuclear reactions with rare isotopes measured at FRIB.

[1]Supported in part by US DoE DE-FG02-93ER40756, DE-SC0018223, US NSF OIA-1738287 and PHY-1913728. Computational resources provided by NERSC (US DoE Contract No. DE-AC02-05CH11231), LSU HPC, and Blue Waters (US NSF OCI-0725070, ACI-1238993, and State of Illinois).