Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Using R-matrix ideas to describe one-nucleon transfers to resonance states[1] J.E. ESCHER, I.J. THOMPSON, Lawrence Livermore National Laboratory, G. ARBANAS, Oak Ridge National Laboratory, CH. ELSTER, V. EREMENKO, L. HLOPHE, Ohio University, F. NUNES, Michigan State University, TORUS COLLABORATION — (d,p) transfer reactions have long been used to investigate nuclear structure. Carried out in inverse kinematics, they are expected to play a central role in the study of weakly-bound systems at modern RIB facilities. While the theoretical framework and its computational implementation for describing (d,p) reactions have seen much progress, open questions remain. Resonances in the low-energy spectra of weakly-bound nuclei, e.g., are of interest for astrophysical applications and can in principle be studied with transfer reactions. Applying standard transfer reaction theories is problematic, both practically in terms of achieving converged solutions and conceptually in terms of interpreting the results. Recently, a new formalism that utilizes concepts known from the successful and popular R-matrix theory was proposed for the description of (d,p) reactions [Mukhamedzhanov, PRC 2011]. The formalism covers transfers to bound and resonance states and is general enough to include deuteron breakup. We present tests of the proposed formalism, compare calculations to measured cross sections, and discuss implications [Escher et al, PRC 2014].

[1]This work, performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344, is supported by the DOE through the topical collaboration TORUS.

J.E. Escher
Lawrence Livermore National Laboratory

Date submitted: 28 May 2014 Electronic form version 1.4