

Abstract Submitted  
for the HAW09 Meeting of  
The American Physical Society

**Study of the  $^{150}\text{Sm}(t, ^3\text{He})$  and  $^{150}\text{Nd}(^3\text{He}, t)$  reactions with applications for the  $0\nu\beta\beta$  decay of  $^{150}\text{Nd}$** <sup>1</sup> CAROL GUESS, NSCL/MSU, NSCL, MSU/RCNP, OSAKA UNIV./UNIV. OF MUENSTER CHARGE-EXCHANGE AND DOUBLE BETA DECAY COLLABORATION — The NSCL charge-exchange group has ongoing programs to measure the spin-isospin response of nuclei. This talk will focus on measurements of the  $^{150}\text{Sm}(t, ^3\text{He})^{150}\text{Pm}^*$  and  $^{150}\text{Nd}(^3\text{He}, t)^{150}\text{Pm}^*$  reactions, which are essential for studies of the neutrinoless double beta ( $0\nu\beta\beta$ ) decay of  $^{150}\text{Nd}$ .  $^{150}\text{Nd}$  is one of the main candidates for  $0\nu\beta\beta$  decay detection experiments. To design detectors for  $0\nu\beta\beta$  decay and to extract information about the neutrino mass scale and hierarchy from resulting experimental data, accurate nuclear matrix elements are needed. Nuclear charge-exchange experiments can constrain theories used to predict these matrix elements by providing Gamow-Teller and higher order multipole transition strengths in the virtual intermediate nucleus. In addition to its applications for  $0\nu\beta\beta$  decay, investigation of the spin-isospin response of heavy, deformed nuclei is important for future work on rare isotopes.

<sup>1</sup>This work was supported by the US NSF (PHY-0606007 and PHY-0822648).

Carol Guess  
NSCL/MSU

Date submitted: 26 Jun 2009

Electronic form version 1.4