Abstract Submitted
for the DNP07 Meeting of
The American Physical Society

Double Beta Decay of ^{150}Nd to Excited Final States MARY KIDD, JAMES ESTERLINE, WERNER TORNOW, TUNL - Duke University — Studying $\beta\beta$ decay with emission of neutrinos ($2\nu\beta\beta$) in particular is important as a check for theoretical models which can be used to predict the half-lives of neutrinoless $\beta\beta$ decay ($0\nu\beta\beta$). Results from studying $2\nu\beta\beta$ decay can aid in the search for $0\nu\beta\beta$ decay, which in turn can provide information on the fundamental properties of the neutrino. Because SNO+ and KamLAND plan to use ^{150}Nd as a nuclide in searches for $0\nu\beta\beta$ decay, our goal is to measure the $2\nu\beta\beta$ decay of ^{150}Nd to the first excited 0^+ state in ^{150}Sm. In QRPA models, the calculated matrix elements for transitions to the ground state and excited states depend in a very different way on the so-called g_{pp} parameter. Therefore, $2\nu\beta\beta$ decay data to excited states are of special interest. Such data exist only for ^{100}Mo; only tentative information is available for ^{150}Nd. Thus, we report on our preliminary studies and our plans for observing the decay of ^{150}Nd to the first excited 0^+ state in ^{150}Sm by detecting the 334 keV and 406.5 keV deexcitation gamma rays in coincidence.

Mary Kidd
TUNL - Duke University

Date submitted: 03 Jul 2007 Electronic form version 1.4