Contribution ID: **39** Type: **Contributed Oral/Poster**

Two-neutron transfer reactions as a probe of isospin mixing effects in superallowed beta decay

Tuesday, 12 July 2016 11:45 (15 minutes)

As part of an ongoing program to study fundamental symmetries in nuclear physics, superallowed Fermi $0^+ \rightarrow 0^+$ β decay provides by far the most precise determination of the vector coupling constant for the weak interaction, G_V. Currently, the precision on the extraction of this quantity from the superallowed data is limited by theoretical corrections that must be applied. These corrections are difficult to calculate, and those that rely on nuclear-structure theory require benchmarking to experimental data. Of particular interest to the isospin-symmetry-breaking (ISB) portion of these theoretical corrections is the degree to which isospin mixing occurs between the isobaric analogue state and other excited 0^+ states. These measurements are particularly difficult for intermediate-mass nuclei, where the superallowed β decay Q-value windows are very large, and 0^+ states with very low reaction cross-sections (~few μb/sr) must be mapped to several MeV. Our recent two-neutron transfer work on both the $A = 62$ and $A = 50$ superallowed systems have shown discrepancies in both the number and energy of previously assigned 0^+ states, thus impacting the magnitude of the currently adopted ISB corrections for these nuclei. These results will be presented, as well as implications of this work for the extraction of G_V from the superallowed data.

Primary author: Prof. LEACH, Kyle (Colorado School of Mines)

Presenter: Prof. LEACH, Kyle (Colorado School of Mines)

Track Classification: Shell evolution through direct reactions - Spectroscopy of nuclear levels and nuclear shapes through direct reactions