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beta-decay feeding from 69,71Co determined from total absorption spectroscopy measurements

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The r process is known to produce roughly half of the abundance of the isotopes of heavy elements. Models of the r-process depend upon theoretical calculations of various nuclear properties such as those from QRPA and Hauser-Feshbach. Sensitivity studies have shown that the final abundance distributions of r-process nuclei are greatly impacted by uncertainties in nuclear masses, neutron-capture rates, as well as beta-decay properties. More specifically, beta-decay half-lives and beta-delayed neutron branching ratios depend on an accurate knowledge of the β-decay strength function. For this reason, β-decay intensities for 69,71Co were determined using the technique of total absorption spectroscopy at the National Superconducting Cyclotron Laboratory at Michigan State University. This technique allows us to overcome the so-called "pandemonium effect, which can cause beta-feeding intensities to high-lying excitation energies to be missed in traditional beta-decay studies. The high Q-values of both 69Co and 71Co allow for the study of beta-decay properties over a broad energy range. The resultant beta-decay intensities and deduced Gamow-Teller strength distributions will be presented and compared to theoretical calculations, including QRPA.

Primary authors: SPYROU, Artemis (NSCL/MSU); LIDDICK, Sean (NSCL/MSU); LYONS, Stephanie (National Superconducting Cyclotron Laboratory)

Co-authors: COUTURE, Aaron (Los Alamos National Laboratory); BROWN, Alex (NSCL/MSU); DOMBOS, Alex (NSCL/MSU); PALMISANO, Alicia (NSCL/MSU); Dr LARSEN, Ann-Cecilie (University of Oslo); Dr CRIDER, Ben (National Superconducting Cyclotron Laboratory); PROKOP, Chris (Los Alamos National Laboratory); BLEUEL, Darren (Lawrance Livermore National Laboratory); Dr NAQVI, Farheen (University of Notre Dame); PERDIKAKIS, Georgios (Central Michigan University); CRESPO CAMPO, Lucia (University of Oslo); Prof. GUTTORMSEN, Magne (Department of Physics, University of Oslo, Norway); SMITH, Mallory (National Superconducting Cyclotron Laboratory); MUMPOWER, Matthew (Los Alamos National Laboratory); MOLLER, Peter (Los Alamos National Laboratory); LEWIS, Rebecca (NSCL/MSU); Prof. SURMAN, Rebecca (University of Notre Dame); VALENTA, S (Charles University Prague); MOSBY, Shea (Los Alamos National Laboratory); QUINN, Stephen (NSCL/MSU); SIEM, Sunniva (University of Oslo); RENSTROM, Therese (University of Oslo)

Presenter: LYONS, Stephanie (National Superconducting Cyclotron Laboratory)

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