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Decay Spectroscopy of Neutron-Rich Cd Around the $N = 82$ Shell Closure (G)*

Monday 11 June 2018 14:15 (15 minutes)

The neutron-rich Cadmium isotopes around the well-known magic numbers at $Z = 50$ and $N = 82$ are prime candidates to study the evolving shell structure observed in exotic nuclei. Additionally, the extra binding energy observed around the nearby doubly-magic ^{132}Sn has direct correlations in astrophysical models, leading to the second r-process abundance peak at $A \approx 130$ and the corresponding waiting-point nuclei around $N = 82$. The β -decay of the $N = 82$ isotope ^{130}Cd into ^{130}In was first studied a decade ago [1], but the information for states of the lighter indium isotope (^{128}In) is still limited. Detailed $\beta\gamma$ -spectroscopy of ^{128}Cd was accomplished using the GRIFFIN [2] facility at TRIUMF, which is capable of performing spectroscopy down to rates of 0.1 pps.

The ongoing analysis of the $^{128,131,132}\text{Cd}$ will be presented. Already in ^{128}Cd , 28 new transitions and 11 new states have been observed in addition to the 4 previously observed excited states [3]. These new results are compared with recent Shell Model calculations. For ^{131}Cd , results will be compared with the recent EURICA data. These data highlight the unique capabilities of GRIFFIN for decay spectroscopy on the most exotic, short-lived isotopes, and the necessity to re-investigate even “well-known” decay schemes for missing transitions.

[1] I. Dillmann *et al.*, Phys. Rev. Let. 91, 162503 (2003)

[2] C.E. Svensson and A.B. Garnsworthy, Hyperfine Int. 225, 127 (2014)

[3] B. Fogelberg, Proc. Intern. Conf. Nuclear Data for Science and Technology, Mito, Japan, p.837 (1988)

Authors: BERNIER, Nikita (TRIUMF); DILLMANN, Iris; KRUECKEN, Reiner (TRIUMF)

Co-authors: ANDREOIU, Corina (Simon Fraser University); BALL, Gordon (TRIUMF); BIDAMAN, Harris (University of Guelph); BILDSTEIN, V. (University of Guelph); DUNLOP, Michelle (University of Guelph); DUNLOP, Ryan (University of Guelph); EVITTS, Lee (TRIUMF); GARCIA, Fatima (Simon Fraser University); GARNSWORTHY, Adam (TRIUMF); HACKMAN, Greg (TRIUMF); JUNGCLAUS, Andrea (Consejo Superior de Investigaciones Científicas (CSIC) (ES)); KISLIUK, Dylan Perry (University of Toronto (CA)); LASSEN, Jens (TRIUMF); MACLEAN, Andrew (University of Guelph); MOUKADDAM, Mohamad (TRIUMF); OLAIZOLA MAMPASO, Bruno (University of Guelph (CA)); PARK, Jason (University of British Columbia/TRIUMF); PETRACHE, Costel (University Paris Sud); PORE, Jennifer; RADICH, Allison (University of Guelph); SMALLCOMBE, James; SMITH, Jenna (TRIUMF); SVENSSON, Carl (University of Guelph); Ms TEIGELHOEFER, Andrea (TRIUMF); TURKO, Joseph (University of Guelph); ZIDAR, Tammy (University of Guelph)

Presenter: BERNIER, Nikita (TRIUMF)

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