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Half-Lives of the Neutron-Rich $N = 82$ Isotopes ^{130}Cd and ^{131}In

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Half-lives of $N = 82$ nuclei below doubly-magic ^{132}Sn are key input parameters for calculations of any astrophysical r-process scenario and play an important role in the formation and shape of the second r-process abundance peak. In the past, shell-model calculations of neutron-rich nuclei near the $N = 82$ neutron shell closure that are not yet experimentally accessible have been performed by adjusting the quenching of the Gamow-Teller (GT) operator to reproduce the half-life of ^{130}Cd [1]. The calculated half-lives of other nuclei in the region are known to be systematically too long. Recently, a shorter half-life for ^{130}Cd was reported [2,3]. A re-scaling of the GT quenching to the new ^{130}Cd half-life by a constant factor resolved the discrepancy [2,3]. However, this GT rescaling creates a new discrepancy in the calculated half-life of ^{131}In.

The half-life measurement of ^{131}In is complicated due to the presence of three known β-decaying states with similar half-lives, making photopeak gating an ideal method to measure each of these half-lives. In this talk, the half-lives of ^{130}Cd and ^{131}In, as well as the spectroscopy of the β and $\beta - n$ decay of ^{131}In measured using the GRIFFIN γ-ray spectrometer at TRIUMF will be presented.

[1] M. Hannawald *et al.*, Nucl. Phys. A **688**, 578 (2001)

[2] R. Dunlop *et al.*, Phys. Rev. C **93**, 062801(R) (2016)

[3] G. Lorusso *et al.*, Phys. Rev. Lett. **114**, 192501 (2015)

E-mail

rdunlop@uoguelph.ca

Collaboration name

GRIFFIN Collaboration

Primary author: Mr DUNLOP, Ryan (University of Guelph)

Presenter: Mr DUNLOP, Ryan (University of Guelph)

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