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Half-Lives of the Neutron-Rich $N \approx 82$ Isotopes $^{128-130}$Cd and ^{131}In (G)*

Monday 11 June 2018 12:15 (15 minutes)

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 ^{130}Cd half-life reported in Ref. [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 for all nuclei in the region resolved the discrepancy. However, the reduced quenching of the GT operator creates a new discrepancy in the calculated half-life of ^{131}In. The measurement of ^{131}In is complicated due to the presence of three known β-decaying states with roughly the same half-life, making photopeak gating an ideal method to measure each of these half-lives. In this talk, the half-lives of $^{128-130}$Cd and ^{131}In, as well as the spectroscopy of ^{131}Sn, 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)
[3] G. Lorusso *et al.*, Phys. Rev. Lett. **114**, 192501 (2015).

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