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(G*) High-precision half-life measurements of ^{26}Na with GRIFFIN

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A high precision half-life measurement was performed for the radioactive isotope, ^{26}Na at the Isotope Separator and Accelerator (ISAC) rare-isotope beam facility at TRIUMF in Vancouver. This is the first experimental test of the high-efficiency Gamma-Ray Infrastructure for Fundamental Investigations of Nuclei (GRIFFIN) spectrometer for performing high precision ($\pm 0.05\%$ or better) half-life measurements [1]. Following the implantation of the samples at the centre of the GRIFFIN spectrometer, a γ -ray counting measurement was performed by detecting 1809-keV γ -rays in the ^{26}Mg daughter. In this talk, I will discuss new results of the half-life obtained from gating on 1809-keV γ -ray photopeaks that include corrections for pile-up and deadtime losses. The results obtained from these techniques will be compared to a previous high-precision measurement of the ^{26}Na half-life that employed direct β counting [2].

KEYWORDS: radioactive isotope, half-life, deadtime, pile-up

References

1. Garnsworthy, A. B., Svensson, C. E., Bowry, M., Dunlop, R., MacLean, A. D., Olaizola, B., ... & Zidar, T. (2019). The GRIFFIN facility for Decay-Spectroscopy studies at TRIUMF-ISAC. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 918, 9-29.
2. Grinyer, G. F., Svensson, C. E., Andreoiu, C., Andreyev, A. N., Austin, R. A. E., Ball, G. C., ... & Zganjar, E. F. (2005). High precision measurements of Na $^{26}\beta$ - decay. Physical Review C, 71(4), 044309.

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