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The First Radioactive Beam at GRIFFIN: ^{26}Na for Decay Spectroscopy

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GRIFFIN (Gamma-Ray Infrastructure For Fundamental Investigations of Nuclei) was installed at the TRIUMF-ISAC-I facility during 2014 and represents a major upgrade to the 8π spectrometer which operated at ISAC for the past decade. With an array of 16 large-volume hyper-pure germanium (HPGe) clover detectors, instrumented with a state-of-the-art digital data acquisition system, the array promises to bring a new level of sensitivity to decay spectroscopy experiments. GRIFFIN is used to investigate a wide variety of nuclear properties relevant to nuclear structure, nuclear astrophysics, and fundamental symmetries using stopped radioactive beams from ISAC and the future ARIEL facility. The most exotic nuclei produced at these facilities are generally produced with the lowest intensity. Additionally, in modern studies of the decay of intense radioactive beams, it is often the weakest decay branches which are of the greatest interest. The high efficiency of the GRIFFIN spectrometer makes spectroscopy possible in both situations.

GRIFFIN was commissioned in the fall of 2014 using a radioactive ^{26}Na beam produced from impinging 500 MeV protons onto a silicon-carbide (SiC) target. The ^{26}Na beam was then implanted into a movable tape at the central focus of the array. The auxiliary detector SCEPTAR (an array of 20 plastic scintillator paddles) was used for beta-tagging while the GRIFFIN spectrometer itself was used for the detection of gamma radiation. A previous experiment, also studying the decay of ^{26}Na, ran under similar conditions using the 8π spectrometer at TRIUMF in 2004. Results highlighting the performance of the GRIFFIN array as well as the structure of the ^{26}Mg daughter will be presented.

Authors: COLLABORATION, GRIFFIN (TRIUMF); BERNIER, Nikita (TRIUMF)

Presenter: BERNIER, Nikita (TRIUMF)

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