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## Investigations of Background and Compton Suppression Shields for GRIFFIN

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GRIFFIN (Gamma-Ray Infrastructure For Fundamental Investigations of Nuclei) will replace the 8pi spectrometer at the TRIUMF ISAC facility by the end of 2014 with an array of 16 large-volume hyper-pure germanium (HPGe) clover detectors and instrument them with a state-of-the-art digital data acquisition system. The facility will be used to investigate a variety of aspects in nuclear structure, nuclear astrophysics and fundamental symmetries using stopped radioactive beams from ISAC. The most exotic nuclei are generally produced with the lowest intensity so in order to perform spectroscopy with these beams the greatest possible sensitivity is required. In addition, in the decay of intense beams it is often the weakest decay branches which are of the greatest interest. It is well established that active Compton-suppression shields comprised of bismuth germanate (BGO) can be an effective tool to increase the peak-to-total ratio of gamma-ray spectra collected with HPGe detectors. These active shields will also suppress background radiations originating from the experimental hall, which will further improve spectral quality. A series of measurements have been performed at ISAC using a GRIFFIN HPGe clover to characterize the spectrum of background events. The detector was then coupled with a TIGRESS BGO Suppression shield to investigate the effectiveness of such active shielding on the final gamma-ray spectrum. These measurements support the funding application for instrumenting the entire GRIFFIN array with suppression shields. A detailed description of the investigations and results will be presented.

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**Author:** BERNIER, Nikita (TRIUMF)

**Presenter:** BERNIER, Nikita (TRIUMF)

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