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## Investigating the Nuclear Shell Closure at $N=32$ in Neutron-Rich $^{52}\text{Ca}$

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Nuclei away from the line of stability have been found to demonstrate behavior that is inconsistent with the traditional magic numbers of the spherical shell model that was developed for nuclei close to stability. This has led to the concept of the evolution of nuclear shell structure in exotic nuclei and the neutron-rich Ca isotopes are a key testing ground of these theories. However, there have been conflicting results from various experiments as to the true nature of a sub-shell closure for neutron-rich nuclei around  $^{52}\text{Ca}$ . In June of 2018, an experiment was performed at the ISAC facility of TRIUMF;  $^{52}\text{K}$  was delivered to the GRIFFIN gamma-ray spectrometer which was paired with the beta-tagger SCEPTAR and the Zero Degree Scintillator auxiliary detectors. Using this powerful combination of detectors, the level scheme of  $^{52}\text{Ca}$  populated following the  $\beta$ -decay of  $^{52}\text{K}$  has been constructed. Preliminary results from the analysis will be presented and discussed in the context of an  $N=32$  shell closure in neutron-rich nuclei.

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