Abstract Submitted
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Nuclear Excitation via Electron Capture with TITAN[1] JON RINGUETTE, TRIUMF Colorado School of Mines, KYLE LEACH, Colorado School of Mines, IRIS DILLMANN, ANIA KWIATKOWSKI, TRIUMF, ZACHARY HOCKENBERY, McGill University TRIUMF, THOMAS BRUNNER, McGill University, CORINA ANDREOIU, Simon Fraser University, TITAN COLLABORATION — Nuclear Excitation via Electron Capture (NEEC) is the inverse process of internal electron conversion, where a free electron is captured into an atomic vacancy simultaneously exciting the nucleus to a higher-energy state. This process occurs naturally in hot astrophysical environments, and can excite nuclei in these isomeric states to shorter-lived states that would decay at a much faster rate than under terrestrial conditions, thus affecting reaction flows or survival rate of nuclei. Since NEEC is a resonant process, experimental access in the lab to study these cases requires strong atomic charge-state control over the sample, as well as careful selection and preparation of nuclear states that may be compatible with efficient electron recombination. Using an open-geometry electron beam ion trap (EBIT) in the TITAN experiment at the TRIUMF facility we are able to perform these studies with a high level of control and sensitivity. In this talk I will discuss the experimental concept, cases that we plan on studying in the near future, simulation results, as well as current and ongoing upgrades being made to the TITAN system.

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