

Nuclear structure studied via mass measurements of exotic nuclei at TITAN, TRIUMF

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Abstract

At TRIUMF's Ion Trap for Atomic and Nuclear Science (TITAN) [1] mass and decay spectroscopy of single and highly-charge ions are possible. A multiple-reflection time-of-flight mass spectrometer (MR-TOF-MS) [2] has extended TITAN's capabilities and facilitates mass measurements of exotic nuclei that so far have not been possible. This MR-TOF-MS also enables mass measurements of very short-lived nuclides (half-life > 1 ms) that are produced in very low quantities (a few detected ions overall). The system offers also unique capabilities to optimize and tune the beam composition [3].

Since the installation of the MR-TOF-MS, it has been used in numerous experiments covering nuclear structure, e.g., nuclear shell effects far off stability [4], and nuclear astrophysics, e.g. neutron star mergers as production side for the 1st peak of the r-process [5]. The presentation will focus on the recent nuclear structure investigation at $N=32$, $N=40$ and $N=82$.

References

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