The TITAN-EBIT: An Electron Beam Ion Trap as a Charge Breeder of Short-Lived Isotopic Highly Charged Ions


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High-precision atomic mass measurements of short-lived isotopic ions at TITAN

The precision of mass measurements is increased using highly charged ions (q=ion charge)

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\frac{\delta m}{m} = \frac{m}{TqB\sqrt{N}}
\]

TITAN-EBIT will trap short-lived isotopic ions produced by ISAC and strip them up to high charge states

Electron density: \(10^4 \text{ A/cm}^2\)

Electron energy: up to 60 keV

TITAN-EBIT built at the MPI-K and shipped to TRIUMF

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The breeding time of highly charged ions is on the order of the half-life of short-lived isotopes.

TITAN-EBIT results: De-excitation and Radiative Recombination (RR) of highly charged ions

Operational and recently commissioned at ~20 keV electron beam energy!!

He-like / Li-like Barium

23 keV

25 keV