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Mass measurements of neutron-rich Cr isotopes to investigate the N=40 island of inversion ROSHANI SILWAL[1], Appalachian State University, Boone, NC, ANDREW JACOBS, ANIA KWIATKOWSKI, TRIUMF, Vancouver, BC , TITAN COLLABORATION — Atomic mass measurements of short-live radioactive isotopes are useful to determine the nuclear structure and deviations from the existing nuclear models, and to explore the nuclear astrophysics reaction paths that are responsible for creating visible matter. Here, we present the mass measurement of neutron-rich chromium isotopes using the extremely sensitive electrostatic Multiple-Reflection Time-Of-Flight Mass Spectrometer (MR-TOF-MS) at TRIUMF's Ion Trap for Atomic and Nuclear Science (TITAN) facility. Cr lies midway in the transition region between the Z = 20 and 28 proton shell closures. This region is particularly interesting due to the onset and evolution of nuclear deformation as nuclei become more neutron rich. Combined with the state-of-the-art ab-initio models, we investigate the N=40 island of inversion using our precise measurements of $^{59-65}$Cr. The new measurement allows for the extension to the mass surface beyond N=40 and provides a challenging testing ground for emerging ab-initio nuclear structure models.

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