



Contribution ID: 167

Type: Oral

Exploring the limits of existence of heavy neutron-deficient nuclei in the $Z=70-82$ region

Alpha-, beta-, and proton-decay energies have been combined with TITAN mass values for $^{150-157}\text{Yb}$ to expand and refine the mass surface in the proton-rich $Z = 70 - 82$ region. The calculations were performed using the Atomic Mass Evaluation (AME) algorithm. As a result, a total of 11 new ground state masses were accordingly determined while the uncertainties were reduced by more than a factor of two for 9 previously determined ground-state masses. The new information allows the determination of the two-proton drip line for elements between Ir and Pb and provides predictions of new candidates for two-proton emission. In addition, we examine binding energies in this region for Thomas-Ehrman shifts, so far only visible for light nuclides.

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Session Classification: Poster Session

Track Classification: Poster Presentations