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Recent nuclear binding-energy studies with ISOLTRAP

Content

The trends of nuclear binding-energies, obtained from high-precision atomic mass values, are sensitive to a wide range of nuclear structure phenomenon such as shell effects or onsets of collectivity. Hence, binding energies enable to track down the evolution of nuclear structure in yet unexplored region of the nuclear chart, also providing essential inputs to many nuclear models.

Three decades ago, the ISOLTRAP mass spectrometer [1], located at the radioactive ion-beam facility ISOLDE/CERN, pioneered the technique of on-line Penning-trap mass spectrometry of short-lived isotopes. Ever since, ISOLTRAP's research effort has been dedicated to the study of exotic nuclear species in key regions of the nuclear chart. This poster will present results from two of the most recent measurement campaigns performed with ISOLTRAP. First, the persistence of the neutron N=28 shell closure in the Argon isotopic chain will be addressed in the light of very recent measurements of the atomic mass of $^{46-48}$Ar. Results from a measurement campaign dedicated to the neutron-rich $^{58-63}$Cr isotopes will also be presented. The latter measurements provide new insights into the development of ground-state collectivity towards the region of nuclear deformation around N=40.

[1] Mukherjee et al., Eur. Phys. J. A 35, 1-29 (2008).

Summary

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