Precision mass measurements at ISOLTRAP for nucleosynthesis studies

D. Atanasov,[1] P. Ascher,[2] K. Blaum,[3] R. B. Cakirli,[4] T. E. Cocolios,[5] F. Herfurth,[6] A. Herlert,[7] W. Huang,[8] J. Karthein,[1,3] I. Kulikov,[9] Yu. A. Litvinov,[6] D. Lunney,[8] V. Manea,[1] M. Mougeot,[8] D. Neidherr,[6] L. Schweikhard,[10] T. P. Steinsberger,[9] A. Welker,[11] F. Wienholtz,[1,10] and K. Zuber[11]

[1]*CERN, CH-1211 Geneva, Switzerland*
[2]*CENBG-IN2P3-CNRS, Université Bordeaux 1, 33175 Gradignan, France*
[3]*Max-Planck-Institut für Kernphysik, 69117 Heidelberg, Germany*
[4]*Department of Physics, University of Istanbul, 34134 Istanbul, Turkey*
[5]*Instituut voor Kern- en Stralingsfysica, Katholieke Universiteit Leuven, B-3001 Leuven, Belgium*
[6]*GSI Helmholtzzentrum für Schwerionenforschung GmbH, 64291 Darmstadt, Germany*
[7]*FAIR GmbH, 64291 Darmstadt, Germany*
[8]*CSNSM-IN2P3-CNRS, Université Paris-Sud, 91406 Orsay, France*
[9]*Universität Heidelberg, 69117 Heidelberg, Germany*
[10]*Universität Greifswald, Institut für Physik, 17487 Greifswald, Germany*
[11]*Technische Universität Dresden, 01069 Dresden, Germany*

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The evolution of binding energies in isotopes found far from stability provides important input not only to nuclear theory, but also to astrophysics simulations. Despite the enormous progress made during the last 80 years in the description of nucleosynthesis, there are still many problems left to be solved e.g. the astrophysical site of rapid neutron-capture process (*r*-process). In this context, experiments in nuclear physics continue to develop and extend the boundaries of determined ground state properties of isotopes within the paths of the relevant astrophysical processes. Furthermore, nuclides around the shell closures are of the utmost importance for the correct understanding and description of the main observed features of the nucleosynthesis, such as the elemental abundances and light curves, and have been targeted by many experiments worldwide.

In the last years at ISOLDE/CERN, the Penning-trap mass spectrometer ISOLTRAP focused efforts in the mass region at $N = 82$ below the tin isotopic chain. Mass measurements of cadmium isotopes are now revealing for the first time the strength of the shell gap encountered by the *r*-process. Furthermore, precision mass measurements in the region below doubly-magic ^{100}Sn were performed. Atomic masses of $^{99-101}$In allow the study of the $Z = N = 50$ shell closure and its impact on the rapid proton-capture process. In this contribution, new developments, results from both measurement campaigns as well as physics discussion will be presented.