RECENT UPGRADES OF THE SHIPTRAP SETUP: ON THE FINISH LINE TOWARDS DIRECT MASS SPECTROMETRY OF SUPERHEAVY ELEMENTS

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Penningtrap mass spectrometry allows direct and reliable measurements of atomic masses with very high precision. This technique is especially suitable to investigate the nuclear structure evolution of radioactive nuclides through measurements of binding energies.

The heaviest elements investigated to date in pioneering experiments with the SHIPTRAP setup at GSI, Darmstadt, have been nobelium and lawrencium [1,2]. The existence of such heavy nuclei is intimately connected to nuclear shell effects that stabilize them against spontaneous fission. The direct measurement of the masses of $^{252-255}$No and ^{255,256}Lr has allowed mapping the strength of the deformed subshell closure at N=152. In order to extend such studies to heavier and more exotic nuclides, the efficiency, precision and sensitivity of the SHIPTRAP setup is being further increased [3].

In this talk, an overview of the ongoing developments will be presented. In particular, a cryogenic buffer gas-stopping cell [4] will be described along with the results of its online commissioning. The implementation of the PI-ICR technique to the regime of the superheavy elements will be discussed. The upgrade of the SHIPTRAP setup after its recent "relocation" and the first online characterization of its performances will be also given.

REFERENCES

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