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High-precision mass measurements of $^{129-131}\text{Cd}$ and their impact on nuclear astrophysics

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The high-precision mass spectrometer ISOLTRAP has been pioneering Penning-trap mass measurements of exotic nuclei already since 1987, when it was installed at the ISOLDE 1 facility, connected to CERN's Synchrocyclotron (SC). After the move of ISOLDE to the Proton Synchrotron Booster (PSB) in 1990, the ISOLTRAP experiment reassumed its successful mass-measurement campaign on short-lived nuclei, which continues until today [1].

During the recent first long shutdown of CERN (LS1), ISOLTRAP has undergone a prolonged maintenance operation, including a full refurbishment of its superconducting magnets. With the restart of physics at ISOLDE in the summer of 2014, ISOLTRAP contributed to a number of experiments.

The contribution will briefly report on the work that was performed during LS1 and describe the current status of the setup. The results of the first successful beam times of 2014 will be discussed. One of the highlights is the mass measurement of the r-process waiting-point nuclide ^{130}Cd and of its neighbors $^{129,131}\text{Cd}$. In addition, ISOLTRAP contributed to the study of the hyperfine structure of astatine isotopes by in-source laser spectroscopy and allowed yield studies of different ISOLDE beams in support of on-going target and ion source developments.

References:

[1] H.J. Kluge, *Int. J. Mass. Spectrom.* 349-350 (2013) 26-37

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