Mass Measurements for Nuclear Structure Studies of Kr and Ag at ISOLTRAP *

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With the Penning trap mass spectrometer ISOLTRAP, located at the isotope separator ISOLDE at CERN, masses of short-lived radionuclides can be measured with relative uncertainties down to 10^{-8}. In 2009, the masses and thus the nuclear binding energies of ^{96,97}Kr and $^{122-124}$Ag were measured. These measurements serve nuclear structure studies as well as tests of the predictive power of mass models.

The determination of the neutron-rich silver masses clarified the previously observed, unexpected behaviour of the two-neutron separation energies (S_{2n}) of this isotopic chain. Now, the S_{2n} values follow the trend expected for spherical nuclei. The masses of ^{96,97}Kr were measured for the first time and indicate a critical point of a quantum phase transition region: For higher Z, a sudden deformation occurs around $N = 60$. With our newly measured masses, however, there is no deformation visible for krypton from the two-neutron separation energies. This identifies the krypton chain as the border of the region of deformation.

In this contribution, the experimental setup, the measurement principle, as well as the above-mentioned results will be presented and discussed.

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