

# Nuclear structure research and the discovery of a new isotope with the Penning trap mass spectrometer ISOLTRAP

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In August 2008 the masses of neutron rich Xe and Rn isotopes were measured at the tandem Penning trap mass spectrometer ISOLTRAP with a relative mass precision down to a  $1 \times 10^{-8}$ . During this online period the masses of  $^{143-146}\text{Xe}$  and  $^{223-229}\text{Rn}$  were measured, many of them for the first time directly. In addition the short-lived nuclide  $^{229}\text{Rn}$  has been observed for the very first time and aside of its mass also a preliminary life-time measured has been performed. With these new mass values one can study the proton-neutron interaction  $\delta V_{pn}$  and therefore get information about the nuclear structure like collectivity, the onset of deformation or the geometrical shapes in atomic nuclei [1]. The experimental results as well as the impact on the theoretical models will be presented.

[1] R.B. Cakirli et al, Phys. Rev. Lett. 94, 092501 (2005).

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