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Mass and isotope shift measurements of neutron-rich tungsten isotopes at KISS

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The nuclei around Z = 72 - 78 are known as transitional nuclei, exhibiting a multitude of nuclear shapes depending on the neutron and proton numbers (N and Z) [1]. Around N = 116, various theoretical calculations predict prolate deformation for lighter isotopes, passing through γ-soft or triaxial shapes, and reaching oblate shapes in heavier isotopes [2,3]. The evolution of their nuclear structure has been investigated through the level structure and properties of β- and K-isomer decays obtained from γ-ray spectroscopy, nuclear electromagnetic moments, and charge radii obtained from laser spectroscopy, mainly for nuclei around the β-stability line and beyond N = 116 for osmium (Z = 76) and platinum (Z = 78). For neutron-rich nuclide around tungsten, fewer experimental results are known due to the difficulty of production.
The KEK Isotope Separation System (KISS) [4] was developed to perform nuclear spectroscopy of heavy neutron-rich isotopes produced by multi-nucleon transfer reactions. We conducted precise mass measurements using a multi-reflection time-of-flight mass spectrograph and isotope shift measurements of neutron-rich tungsten isotopes at KISS to study shape evolution. In this contribution the recent measurement results will be reported.
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Workshop Themes

RIS, scheme development, atomic spectroscopy

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