



Contribution ID: 68

Type: **Talk**

Isomers explored with novel ion-trapping techniques at JYFLTRAP

Tuesday, 3 May 2022 14:15 (30 minutes)

Penning-trap mass spectrometry offers a way to determine excitation energies of isomeric states via high-precision mass measurements. The method is very useful for beta-decaying isomers with half-lives longer than around 100 ms. Excitation energies of such isomers are often challenging to unambiguously determine with other techniques. Penning-trap mass spectrometry can also reveal new isomeric states. For example, a new high-spin isomer in ^{128}In was recently discovered with the JYFLTRAP double Penning trap at the Ion Guide Isotope Separator On-Line (IGISOL) facility.

Low-lying isomeric states have been challenging for experiments and for many nuclei it has remained unclear which state is the ground state. The resolving power of Penning traps has increased considerably with the phase-imaging ion cyclotron resonance (PI-ICR) technique, capable of resolving very low-lying isomeric states down to excitation energies of around 20 keV. A large number of low-lying isomeric states e.g. in neutron-rich Ru, Rh, Ag and In isotopes have been recently resolved and measured using the PI-ICR technique at JYFLTRAP. In many cases, the measurements have been supported by laser or post-trap decay spectroscopy to further identify the studied states. In this contribution, I will give an overview with selected highlights of recent studies on isomers at JYFLTRAP.

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Session Classification: Precision Mass Spectrometry, Nuclear Structure