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Isomeric yield ratios in fission for odd mass $^{119-125}$Cd and $^{119-127}$In isotopes with the Phase-Imaging Ion-Cyclotron-Resonance technique

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Measurements of isomeric yield ratios can provide important information about the angular momentum of the fission fragments, whose origin is still one of the many open questions regarding the fission process. Although it is well established that they carry considerable amount of angular momentum, there are competing theories on how this is generated.

We will report the first systematic study of independent isomeric yield ratios for the odd mass isotopes of $^{119-127}$In, $^{119-125}$Cd, performed at the Ion Guide Isotope Separator On-Line facility at the University of Jyväskylä using the JYFLTRAP Penning trap. From the experimentally determined isomer production ratios the root-mean-square angular momenta (J_{rms}) of the initial fission fragments after scission were estimated using the nuclear reaction code TALYS. The study provide important information on how Jrms evolve with respect to the mass number A, approaching the closed neutron shell configuration ($N = 82$).

The measurements were possible thanks to a novel approach based on the projection of the Penning Trap ion motion onto a position-sensitive detector. The new Phase-Imaging Ion-Cyclotron-Resonance (PI-ICR) technique, recently implemented at JYFLTRAP, provides a superior mass resolving power, where isomers with excitation energies down to 50 keV can be readily separated from the ground state. In this presentation we describe the PI-ICR method as well as the results and our conclusions.

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