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Investigation of isomers in heavy nuclei

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In heavy and superheavy nuclei with Z > 100 several isomeric states are known to exist. Some of these isomers are rather long-lived and feature low excitation energies making their identification sometimes challenging. With the Penning-trap mass spectrometer SHIPTRAP at the GSI in Darmstadt, Germany, we can identify long-lived isomers and determine their excitation energy accurately. In recent experiments carried out within the FAIR phase-0 program at GSI we have studied several isomers in No, Lr, and Rf isotopes. These experiments are very challenging due to the low production rates of the nuclide of interest and the high mass resolving powers required for isomers with tens of keV excitation energy. In my contribution I will present selected recent results to illustrate the performance of the method and discuss future perspectives. Furthermore, I will address our activities to determine the configuration of the K=8- isomer in No-254 by laser spectroscopy.

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