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Decay spectroscopy of isotopes above Fermium

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The deformation of atomic nuclei is one of the important features significantly influencing the properties of the heaviest isotopes far above uranium. It is a decisive factor for their single-particle level structure, with an essential impact on the decay properties and, afterwards, the stability of heaviest nuclei with an odd number of protons or neutrons. Nuclear deformation is also crucial for the existence of phenomena like K isomers. Although there are available theoretical predictions for low-lying single-particle states of isotopes above fermium (see for example [1–3]), experimental data are scarce in this region. For many of these isotopes, even the ground-state or first excited states remain unassigned.
The use of sensitive α- and γ-decay studies combined with conversion-electron (CE) spectroscopy allowed detailed experimental studies of many isotopes in the region of heaviest nuclei (A > 250). This approach was applied in an extensive program aimed at nuclear structure studies of isotopes above fermium using α-CE, α-γ and CE-γ spectroscopy at the velocity filter SHIP of GSI Darmstadt.
This seminar will summarize some recent results obtained for the examples of recent studies –mainly isomeric states in ^{255}Rf [4,5] and ^{247}Md [6]. In addition, open problems for the single-particle level systematics of odd-Z isotopes will be discussed, as well.

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Orateur: ANTALIC, Stanislav (Department of Nuclear Physics and Biophysics, Comenius University Bratislava, Slovakia)

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