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Jumps and bumps in charge radii around Z=82

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The neutron-deficient lead region has myriad competing configurations of differing nuclear shapes. This competition is greatest when approaching the N=104 midshell, where deformation driving residual interactions become strong enough to challenge the stabilising effects of the nearby proton shell closure. Here, spherical, prolate, and oblate shapes can all be found as either ground or low-lying excited states in the isotopes that inhabit this region of the nuclear chart.

In recent years, a wide-ranging study has been made at the CERN-ISOLDE facility, using the in-source laser spectroscopy technique. In these experiments, isotope shift and hyperfine structure measurements of long chains of isotopes have been made, from which the change in mean-squared charge radii and magnetic dipole moments can be extracted. This talk will present highlights from the experimental campaigns, along with recent theoretical developments that have been made in an attempt to describe the region in a consistent manner, using Hartree-Fock-Bogoliubov calculations involving configuration mixing between states of different deformation.

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