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## Investigating shape coexistence in the lead region with in-source laser spectroscopy at ISOLDE-RILIS

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The competition between spherical and deformed nuclear shapes at low energy gives rise to shape coexistence in the region of the neutron-deficient lead isotopes with  $Z=82$  and  $N=104$  [1]. In order to determine to which extend the ground-state of those isotopes is affected by this phenomenon, a large campaign of investigation of changes in the mean-square charge radii is on-going at ISOLDE. Using the high-sensitivity of the in-source laser spectroscopy technique, which combines the ISOLDE-RILIS lasers with the Windmill alpha-decay spectroscopy setup, it has been possible to study very exotic isotopes of lead [2-3] and polonium [4-6], down to  $N=100$  and  $N=107$  respectively, and more recently thallium down to  $N=99$ . In this contribution, we shall review the experimental observations on lead and polonium and present the first results of the 2011 experiment on thallium.

- [1] A.N. Andreyev et al., Nature 403(2000)430
- [2] H. De Witte et al., PRL 98(2007)112502
- [3] M.D. Seliverstov et al., EPJA 41(2009)315
- [4] T.E. Cocolios et al., JPG 37(2010)125103
- [5] T.E. Cocolios et al., PRL 106(2011)052503
- [6] M.D. Seliverstov et al., Letter in preparation

On behalf of a CERN-KULeuven-Paisley-Gatchina-Oulu-Orsay-Mainz-Bratislava-Brussels collaboration

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