Contribution ID: **5** Type: **Poster**

Shape coexistence and charge radii in gold and astatine isotopes studied by in-source laser spectroscopy at RILIS-ISOLDE

Monday 17 December 2012 18:05 (1h 25m)

On behalf of York-KU Leuven-Gatchina-Mainz-Bratislava-Liverpool-ISOLDE collaboration

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 and/or isomeric states of those and neighboring nuclides are affected by this phenomenon, an extended campaign of investigation of changes in the mean-square charge radii is on-going at ISOLDE. By combining the high sensitivity of the in-source laser spectroscopy technique, ISOLDE mass separation and Windmill alpha-decay spectroscopy setup [2], it has been possible to study long isotopic chains of lead [3] and polonium [4], down to N=100 and N=107 respectively, and, recently, thallium isotopic chain down to N=98 [5].

In this contribution, we will present the systematics of charge radii in thallium isotopes [5] together with the first preliminary results of the 2012 experimental campaign at ISOLDE (IS534 experiment) to study charge radii in the long chains of the astatine and lightest gold isotopes [6]. In the gold and astatine cases, next to Faraday cup and Windmill measurements, also the Multi-Reflection Time-of-Flight (MR-ToF) mass separation technique [7] involving the ISOLTRAP collaboration was used.

References

[1] K.Heyde and J. Wood. Rev. Mod. Physics 83, 1467 (2011)
[2] A.N. Andreyev et al„ Phys. Rev. Lett. 105, 252502,(2010)
[3] H. De Witte et al., Phys. Rev. Lett. 98, 112502 (2007)
[4] T.E. Cocolios et al., Phys. Rev. Lett. 106, 052503 (2011)
[5] A.N. Andreyev, A. Barzakh et al., IS511 experiment at ISOLDE (2012)
[6] A.N. Andreyev, V. Fedosseev, P. Van Duppen et al., IS534 experiment at ISOLDE (2012)
[7] R. N. Wolf et al., Nucl. Instr. and Meth. A 686, 82-90 (2012)

Primary author: Prof. ANDREYEV, Andrei (University of York)

Presenter: Prof. ANDREYEV, Andrei (University of York)

Session Classification: Poster session