

# The Muonic Helium Lamb Shift Experiment

*Wednesday, 17 September 2014 15:10 (20 minutes)*

Muonic atoms have an increased sensitivity on finite size effects of the nucleus due to the ~200-fold mass of the muon compared to the electron. The Lamb shift experiment of the CREMA collaboration in muonic hydrogen [1] and deuterium allowed to determine the proton radius and other nuclear properties with an order of magnitude higher precision, compared to spectroscopic measurements of ordinary hydrogen. As a successor experiment, the determination of the Lamb shift in the muonic helium ions  $\mu^3\text{He}^+$  and  $\mu^4\text{He}^+$  [2] will be a contribution to solving the proton radius puzzle as well as the discrepancy in electronic isotope-shift measurements. On this poster, an overview of the achieved results of the CREMA collaboration is presented and set into the context of the discrepancies to other experimental findings. Recent results from the measurements on helium isotopes during spring/summer 2014 are included.

[1] R. Pohl et al. (CREMA coll.), Nature 466, 213 (2010)

[2] A. Antognini et al. (CREMA coll.), Can. J. Phys. 89, 47-57 (2011)

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**Session Classification:** session II