Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Nuclear structure corrections for μ4He+ and μ3He+ spectroscopy[1] NIR NEVO DINUR, TRIUMF, Canada, CHEN JI, ECT* and INFN, Italy, OSCAR HERNANDEZ, TRIUMF and UBC, Canada, SONIA BACCA, TRIUMF and University of Manitoba, Canada, NIR BARNEA, The Hebrew University of Jerusalem, Israel — The proton charge radius was recently determined from muonic hydrogen spectroscopy [1] with tenfold improved precision but 7.9σ disagreement with the accepted value, leading to the "proton radius puzzle". To further investigate, and to obtain precise radii, these measurements were repeated in μ^4He^+ and μ^3He^+ [2]. This may also shed light on the discrepancy between isotope-shift measurements of the ^{4}He–^{3}He radius difference. However, the precision of radii determined from the muonic experiments is limited by the uncertainties in the nuclear structure corrections [2]. We present first *ab-initio* calculations of these corrections [3,4] that reduced the uncertainties from $\sim$20% to the few percent goal.

R. Pohl *et al.*, Nature **466**, 213 (2010); A. Antognini *et al.*, Science **339**, 417 (2013). [2] M. Diepold *et al.*, arXiv:1606.05231 [physics.atom-ph]. [3] C. Ji *et al.*, Phys. Rev. Lett. **111**, 143402 (2013). [4] N. Nevo Dinur *et al.*, Phys. Lett. B **755**, 380 (2016).

[1]TRIUMF receives federal funding via a contribution agreement with the National Research Council of Canada. This work was supported in parts by the Natural Sciences and Engineering Research Council (Grant number SAPIN-2015-00031)

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Date submitted: 01 Jul 2016 Electronic form version 1.4