High-precision ground-state fine and hyperfine spectroscopy at µTEx

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At our Penning-trap experiment µTEx in Heidelberg, Germany, we measure the ground-state fine- and hyperfine-structure splitting of light, hydrogenlike ions and nucleons in a magnetic field [1]. From the measured transitions, the bound electron and shielded nuclear g-factors as well as the hyperfine-structure constant are extracted. In comparison with theory calculations, this allows to test QED, to infer charge radii of nuclei and to precisely determine fundamental constants such as the electron mass and nuclear magnetic moments. Comparisons to additional lithiumlike measurements allow testing of nuclear magnetic shielding theory. The results of the latest ^{9}Be campaign [2] as well as ongoing measurements and future plans will be presented.

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References

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