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Testing QED with spectroscopy of Highly charged ions from medium Z to high Z

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Spectroscopy of few electron highly-charged ions from medium to high atomic number Z allows to probe Quantum Electrodynamics (QED) effects in strong Coulomb fields. For such systems, theory can provide high-accuracy predictions, but experiments struggle to attain comparable precision. We present here two new measurements aimed at highest precision transition energy measurements in the X-ray regime to test strong field QED effects. The first measurement is on boron-like Argon, performed in Paris with an Electron Cyclotron Resonance Ion Source and a double crystal spectrometer. This is an absolute energy measurement with an accuracy of a few parts per million. Another experiment, recently performed at the ESR at GSI, Darmstadt, focused on the measurement of an intra-shell transition of heliumlike Uranium (two electrons present only), and achieved an accuracy of 35 parts per million. I will present these two results, and their impact on our understanding of bound-state QED in the strong field regime.

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