

Scale separation in exotic atoms

Spectroscopy experiments at the precision frontier allow us to study low-energy nuclear structure, test bound-state QED, refine fundamental constants, and potentially find New Physics. As the experimental uncertainties are continuously improved, theory predictions need to follow suit.

The finite-size corrections to the spectra of hydrogen-like atoms are often expanded in terms of the moments of the nuclear charge distribution, e.g. the charge and Friar radii. Contributions to the form factors that involve scales lighter than the inverse Bohr radius of the system can break this expansion.

In this poster, we illustrate the breaking and explain how spectroscopy experiments can probe physics beyond the Standard Model.

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Session Classification: Poster session