

Towards improved charge radii from Lithium to Neon

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Absolute nuclear charge radii provide essential input to improve our understanding of the strong interaction at low energies, and allow the confrontation of experiment and theory in simple atomic systems. However, precision measurements of the radii of light nuclei above helium have been mostly out of reach of the currently employed methods.

QUARTET is a new experiment aiming to address this gap by performing precision cascade x-ray spectroscopy from $\mu^6\text{Li}$ to $\mu^{22}\text{Ne}$ atoms with metallic magnetic calorimeters - a quantum sensing technology capable of high efficiency over a wide energy range with excellent resolution for low-energy x rays. In this talk I will review the physics motivation, describe the experimental scheme, and show preliminary results from a successful test beam.

References:

arXiv:2210.16929

arXiv:2310.03846

arXiv:2311.12014

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