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Precision microwave measurements of n=2 states in simple atoms: Determination of the fine-structure constant and the charge radius of the proton[1]

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A high-precision measurement of the fine structure of the n=2 states of atomic hydrogen is being performed as a test of both quantum electrodynamics and to determine the charge radius of the proton. The proton radius has been a matter of great interest in the past years, since measurements made with muonic hydrogen show a large disagreement with those obtained using electrons. A precision measurement of the helium n=2 fine structure also tests quantum electrodynamics, but may additionally be used to determine the fine-structure constant.

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