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Proton and deuteron radius measurements with ultra-low energy electron scattering

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The proton is the simplest element of matter and the deuteron is the simplest compound nucleus; however, the measurements of their charge radii present significant puzzles. These puzzles are still unresolved, as they originate from the fact that the radii measured with high precision in muonic spectroscopy differ from those measured in ordinal-atom spectroscopy and electron scattering.

To obtain the most reliable proton and deuteron charge radii for electron scattering, a new ultra-low energy electron scattering facility has been built at RARiS, Tohoku University. We have almost finished data taking for the proton and deuteron radius measurements, and analysis is ongoing. I will talk about the current status of our experiment.

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