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Precision measurement of the proton charge radius with elastic electron scattering* — ●INNA PYSMENETSKA, PETER VON NEUMANN-COSEL, SARLA RATHI, ACHIM RICHTER, GERHARD SCHRIEDER, and ARTEM SHEVCHENKO — Institut für Kernphysik, Technische Universität Darmstadt

A precise measurement of the proton charge radius is an old, but still open problem. Interest is renewed by extremely precise Lamb Shift measurements [1] requiring higher-order QED corrections for their interpretation depending on the proton charge radius. Existing measurements show a considerable scattering of results. A new precision experiment using elastic electron scattering is now in preparation at the S-DALINAC, where backscattered protons instead of the electrons will be measured. This new method has many advantages. For example, one can measure range of momentum transfers with a single setup, thereby avoiding normalization problems. Recent test measurements demonstrate the feasibility of such a kind of experiment, but several problems need to be solved first. Preliminary results and conclusions are discussed.

[1] S.G.Karshenboim, Can. J. Phys. 77 (1999) 241

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