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The Muon Proton Scattering Experiment (MUSE) at PSI

In 2010, high-precision studies of muonic hydrogen found notably smaller values for the charge radius than earlier results that have been extracted from elastic electron-scattering data and through the spectroscopy of atomic hydrogen. The MUon Scattering Experiment (MUSE) at the Paul Scherrer Institute (PSI) has been developed to address this so-called proton-radius puzzle. The experiment will measure elastic electron-proton and muon-proton scattering data with positively and negatively charged beams in a four-momentum-transfer range from 0.002 to 0.08 GeV². Each of the four sets of data will allow the extraction of the proton charge radius. In combination, the data test possible differences between the electron and muon interactions and two-photon exchange effects. The status of the experiment will be discussed.

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