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Measuring the polarizabilities of the proton and pion with photon and hadron beams

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Polarizabilities provide an important test point for models of hadron structure, as well as potentially helping to resolve two of the most outstanding anomalies in nuclear physics, the muon g-2 and the proton charge radius puzzles. Recent progress in measurements of the proton scalar polarizabilities, α and β, and spin-polarizabilities from polarized Compton scattering experiments at Mainz and TUNL/HIGS are presented. This new generation of Compton scattering experiments utilize linear/circularly polarized incident photons and polarized targets. For many years the charged pion polarizability ranked among the most important tests of ChPT unresolved by experiment. A new result for the charged pion polarizability from the Compass experiment is presented, and the outlook for a precision measurement of the charged pion polarizability at JLab through the $\gamma\gamma \to \pi^+\pi^-$ reaction is discussed.