

MOTIVATING PROTON STRUCTURE EXPERIMENTS

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Of all the known mass in the universe, 99% of it comes from just two particles: the proton and neutron. These particles are not fundamental but are instead comprised of fundamental, point-like quarks and gluons. The global properties of the proton result from complex interactions between the quarks and gluons. Electron-proton scattering is a useful tool to study the quark-gluon interactions. At lower momentum transfer (larger electron wavelengths), the electron probes the full extent of the proton and deviations from point-like behavior for the proton are observed. The nature of the theory makes it difficult to calculate the proton structure dependence on the electron-proton interaction directly, but it can be extracted experimentally. These proton structure experiments then become critical for a complete understanding of the nucleon.