

Abstract Submitted
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Overview of the Qweak Experiment at Jefferson Lab¹ SIYUAN YANG, College of William and Mary, QWEAK COLLABORATION — The weak charge of the proton, Q_{weak} , which measures the strength of the coupling of the Z^0 to the proton, is precisely predicted in the Standard Model. Any deviation from this predicted value would signal the presence of new physics. At tree level in the Standard Model, Q_{weak} is proportional to $1 - 4 \sin^2 \theta_w$, which is a small number. Therefore, Q_{weak} is particularly sensitive to possible new physics. An experiment is being constructed at Jefferson Lab to determine Q_{weak} by measuring the parity-violating asymmetry in the elastic scattering of longitudinally polarized electrons from the proton at very low momentum transfer. This small asymmetry, which arises due to electroweak interference, will allow us to determine the weak charge to a 4% precision, which will probe new physics at the TeV scale. A toroidal magnetic spectrometer will focus scattered electrons from a hydrogen target onto a set of eight Cerenkov detectors, which will integrate the scattered flux of 800 MHz per detector. The physics goal of the experiment will be discussed, and an overview of the apparatus will be presented.

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David Armstrong
College of William and Mary

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