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Pion Form Factor: Present and Future¹

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The pion charge form factor, F_π , is of key interest in the study of the quark-gluon structure of hadrons. The valence structure of the pion $\langle q\bar{q} \rangle$ is relatively simple, so it is used as a test case for all models of hadronic structure. Experimentally, the measurement of the pion form factor poses special challenges. The technique utilizes a precision Rosenbluth separation of the $p(e, e'\pi^+)n$ reaction at low $-t$. F_π is then extracted from the separated σ_L cross sections with the aid of a model. Over the past several years, we have mounted two experiments at Jefferson Lab (JLab) to measure F_π over the range of $Q^2 = 0.6$ to 2.45 GeV². These measurements are planned to be extended to higher Q^2 with the completion of the JLab 12 GeV upgrade. These data would challenge QCD-based calculations in the most rigorous manner. The recent JLab data will be presented and compared to a variety of model calculations, and the future outlook will be discussed.

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