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Type of Participation:
Contribution

Title:
Flavor Decomposition of the Nucleon Electromagnetic Form Factors Including Phenomenological Two-Photon Exchange Corrections

Abstract:

We report on a new extraction of the flavor decomposition of the nucleon electromagnetic form factors based on phenomenological two-photon-exchange corrections (TPE) to the electron-proton elastic scattering cross sections. New measurements of the neutron's electric to magnetic form factors ratio, $R_n = \mu_n G_{En}/G_{Mn}$, up to 3.4 (GeV/c)^2 combined with previous $R_p = \mu_p G_{Ep}/G_{Mp}$ measurements in the same Q^2 range allowed, for the first time, a separation of the up- and down-quark contributions to the nucleon form factors at high Q^2 as well as a detailed comparison of the ratios F_{2n}/F_{1n} and F_{2p}/F_{1p} . The initial analysis by Cates et al., included the dominant uncertainties coming from the extraction of R_n , but neglected TPE corrections and the uncertainties in the proton form factors which are typically much smaller. Our new analysis expands on the original by including TPE corrections to the proton form factors, adding the recent CLAS G_{Mn} extractions, and accounting for the uncertainties in all of the nucleon form factors. With these new modifications, we extract a complete set of flavor-separated form factors up to $Q^2 \sim 4.0 \text{ (GeV/c)}^2$. In this talk we will present our results, discuss the TPE correction procedure used, as well as the updated extraction of the magnetic form factor of the neutron, and compare these results to recent calculations.