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Nucleon Electromagnetic and Axial-Vector Form Factors

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The nucleon form factors have been evaluated in light of the improved precision of the experimental measurements and enormous theoretical progress to understand the dynamical behavior of nucleons emerging from the theory of strong interactions between quarks. We have analysed the vector and axial-vector nucleon form factors ($G_{E,M}^{p,n}(Q^2)$ and $G_A^{p,n}(Q^2)$) using the spin observables in the chiral constituent quark model (χ CQM) which has made a significant contribution to the unraveling of the internal structure of the nucleon in the nonperturbative regime. A comprehensive analysis of the flavor decomposition of the form factors ($G_E^q(Q^2)$, $G_M^q(Q^2)$ and $G_A^q(Q^2)$ for $q = u, d, s$) has also been presented. The Q^2 dependence of the vector and axial-vector form factors of the nucleon has been studied using the conventional dipole form of parametrization. The results are in agreement with the available experimental data.

Primary authors: Dr DAHIYA, Harleen (Dr. B.R. Ambedkar National Institute of Technology, Jalandhar); Dr RANDHAWA, Monika (Panjab University, Chandigarh)

Presenters: Dr DAHIYA, Harleen (Dr. B.R. Ambedkar National Institute of Technology, Jalandhar); Dr RANDHAWA, Monika (Panjab University, Chandigarh)

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