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Electromagnetic Form Factors through Parity-Expanded Variational Analysis

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Variational analysis techniques in lattice QCD are powerful tools that give access to the full spectrum of QCD. At zero momentum, these techniques are well established and can cleanly isolate energy eigenstates of either positive or negative parity.

In order to compute the form factors of a single energy eigenstate, we must perform a variational analysis at nonzero momentum. When we do this with baryons, we run into issues with parity mixing, as boosted baryons are not eigenstates of parity. I present the parity-expanded variational analysis (PEVA) technique, a novel method for ensuring the successful and consistent isolation of boosted baryons. This is achieved through a parity expansion of the operator basis used to construct the correlation matrix.

Nucleon form factor calculations using this new technique are presented, showing the improvement over conventional methods.

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