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Nucleon isovector form factors from domain-wall lattice QCD at physical mass

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The current status of lattice-QCD numerical calculations by joint LHP and RBC collaborations of nucleon isovector vector- and axialvector-current form factors using a 2+1-flavor dynamical domain-wall fermions lattice QCD ensemble generated jointly by RBC and UKQCD collaborations will be presented. The lattice spacing is set at about 0.1141(3) fm, and the lattice spatial extent is 48 spacings or about 5.4750(14) fm. The dynamical strange and degenerate up and down quark mass values are set at their essentially physical values to provide the physical Ω mass and a degenerate pion mass of 0.1392(2) GeV. Our nucleon mass estimate is about 0.947(6) GeV. Possible excited-state contaminations in the calculated vector- and axialvector-current form factors are hidden below larger statistical noises. The numerical details of the form-factor shape parameters, such as the mean squared radii, the anomalous magnetic moment, or the pseudoscalar coupling extracted from the form factors, will be given, along with comparisons of different approaches used to extract them.

Topical area

Structure of Hadrons and Nuclei

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