

Nucleon structure from lattice QCD on $(10 \text{ fm})^4$ at the physical point

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We present results for the axial charge and root-mean-square (RMS) radii of the nucleon obtained from 2+1 flavor lattice QCD at the physical point with a large spatial extent of about 10 fm. Our calculations are performed with the PACS10 gauge configurations generated by the PACS Collaboration with the six stout-smear $O(a)$ improved Wilson-clover quark action and Iwasaki gauge action at $\beta = 1.82$ and 2.00 corresponding to lattice spacings of 0.085 fm and 0.063 fm respectively. We first evaluate the value of g_A/g_V , which is not renormalized in the continuum limit and thus ends up with the renormalized axial charge. Moreover, we also calculate the nucleon elastic form factors and determine three kinds of isovector RMS radii such as electric, magnetic and axial ones at the two lattice spacings. We finally discuss the discretization uncertainties on renormalized axial charge and isovector RMS radii towards the continuum limit.

Recording and publishing

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