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Towards the continuum limit of nucleon form factors at the physical point using lattice QCD

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We present results of nucleon structure studies measured in 2+1 flavor QCD with the physical light quarks ($m_\pi = 135$ MeV) in a large spatial extent of about 10 fm. Our calculations are carried out with the PACS10 gauge configurations generated by the PACS Collaboration with the stout-smearred $O(a)$ improved Wilson fermions and Iwasaki gauge action at $\beta=1.82$ and 2.00 corresponding to the lattice spacings of 0.085 fm (coarser) and 0.063 fm (finer) respectively. When we compute nucleon two-point and three-point functions, the all-mode-averaging technique is employed in order to reduce the statistical errors significantly without increasing computational costs. At both lattice spacings, we evaluate nucleon form factors associated with lepton-nucleon elastic scattering measurements.

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