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The hadronic light-by-light contribution to the muon $g-2$ using staggered fermions at the physical point

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Hadronic contributions dominate the uncertainty of the Standard Model prediction for the anomalous magnetic moment of the muon. In this work, we present results on the hadronic light-by-light contribution obtained from the evaluation of the hadronic four-point function of electromagnetic currents using the position-space formalism developed by the Mainz group. The simulations are performed with staggered fermions directly at the physical point. Our results include continuum extrapolations for connected and leading disconnected diagrams for light, strange and charm quark contributions. Several physical volumes are used to estimate finite volume effects. This direct lattice study is supplemented by considering the contribution of the light pseudoscalar pole in both finite and infinite volumes, where we reuse the transition form factors that have been evaluated in previous simulations on the same ensembles.

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