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Position-space approach to hadronic light-by-light scattering in the muon $g - 2$ on the lattice

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The anomalous magnetic moment of the muon currently shows a more than 3σ discrepancy between the experimental value and recent Standard Model predictions. The theoretical uncertainty is dominated by the hadronic vacuum polarization and the hadronic light-by-light (HLbL) scattering contributions, where the latter has so far only been fully evaluated using different models. To pave the way for a lattice calculation of HLbL, we present an expression for the HLbL contribution to $g - 2$ that involves a multidimensional integral over a position-space QED kernel function in the continuum and a lattice QCD four-point correlator. We describe our semi-analytic calculation of the kernel and test the approach by evaluating the π^0 -pole contribution in the continuum.

Primary authors: Dr NYFFELER, Andreas (Institut für Kernphysik, Johannes Gutenberg-Universität Mainz); Prof. MEYER, Harvey B. (Institut für Kernphysik, Johannes Gutenberg-Universität Mainz); Dr GREEN, Jeremy (Institut für Kernphysik, Johannes Gutenberg-Universität Mainz); Mr ASMUSSEN, Nils (Institut für Kernphysik, Johannes Gutenberg-Universität Mainz)

Presenter: Mr ASMUSSEN, Nils (Institut für Kernphysik, Johannes Gutenberg-Universität Mainz)

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