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Pseudoscalar pole contributions to the muon g-2 from lattice QCD

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Pseudoscalar pole diagrams are the numerically dominant component of the HLbL contribution to the muon $g-2$. We report on our computation of the pion and eta pole contributions from twisted mass lattice QCD at physical quark masses. Pion and eta transition form factors to two photons are the key intermediate quantity required to derive these contributions; on the lattice, we have access to a broad range of photon momenta and therefore produce form factor data complementary to the experimentally accessible singly virtual kinematics. This intermediate result can also be compared directly against such values where they are measured by current and past experiments, such as BES-III, CLEO, CELLO, Belle, and BaBar, and serves as a prediction in kinematic regimes that have not yet been reported. For the pion, the resulting value of $a_\mu^{\pi-\mathrm{pole}}$ is comparable with previous lattice and data-driven determinations, with combined uncertainties achieving sub-10% precision. For the subleading eta-pole contribution, we present a first ab initio determination, with a relative precision below 40%.

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