

Investigation of $\gamma^* \gamma^* \rightarrow \eta'$ at the BESIII Experiment

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The $g - 2$ puzzle describes a sizable discrepancy between the experimental measurements of the muon's magnetic moment and the theoretical Standard Model prediction. In order to determine whether this observed deviation is a significant discovery of possible physics beyond the Standard Model, the uncertainty of the theoretical prediction must be reduced. The primary source of systematic error stems from the hadronic quantum fluctuations affecting the muon, specifically the hadronic vacuum polarization (HVP) and the hadronic light-by-light (HLbL) scattering contributions. The HLbL term is dominated by the exchange of pseudoscalar mesons.

In this poster presentation, the production of pseudoscalar η' mesons via two virtual spacelike photons will be studied ($\gamma^* \gamma^* \rightarrow \eta'$). Double-tagged measurements are conducted at the BESIII experiment in Beijing, China, in which both virtual photons possess nonzero momentum transfers (Q^2). The transition form factor (TFF) needed for the calculation of the HLbL contribution is determined for $Q_1^2, Q_2^2 < 2 \text{ GeV}^2$. Finally, the BESIII TFF results are compared with the Vector Meson Dominance Model and the previous double-tagged measurement of the BABAR collaboration.

Parallel Session

Poster Session

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