

## 03 MUON g-2

### Hadronic light-by-light scattering contribution to the muon g-2

A. Nyffeler

Regional Centre for Accelerator-based Particle Physics, Harish-Chandra Research Institute, Chhatnag Road, Jhusi, Allahabad - 211019, India

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#### 摘要

We review recent developments concerning the hadronic light-by-light scattering contribution to the anomalous magnetic moment of the muon. We first discuss why fully off-shell hadronic form factors should be used for the evaluation of this contribution to the g-2. We then reevaluate the numerically dominant pion-exchange contribution in the framework of large- $N_c$  QCD, using an off-shell pion-photon-photon form factor which fulfills all QCD short-distance constraints, in particular, a new short-distance constraint on the off-shell form factor at the external vertex in g-2, which relates the form factor to the quark condensate magnetic susceptibility in QCD. Combined with available evaluations of the other contributions to hadronic light-by-light scattering this leads to the new result  $a_{\mu}^{\text{LbyL; had}} = (116 \pm 40) \times 10^{-11}$ , with a conservative error estimate in view of the many still unsolved problems. Some potential ways for further improvements are briefly discussed as well. For the electron we obtain the new estimate  $a_e^{\text{LbyL; had}} = (3.9 \pm 1.3) \times 10^{-14}$ .

关键词 [muon, anomalous magnetic moment, hadronic contributions, effective field theories, large- \$N\_c\$](#)

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DOI:

通讯作者:

A. Nyffeler [nyffeler@hri.res.in](mailto:nyffeler@hri.res.in)

作者个人主页:

A. Nyffeler

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