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A revision of radiative corrections to double-Dalitz decays

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Collaboration

Abstract content

The transition form factors (TFFs) of pseudoscalar mesons were—and continue to be—an active field of research, especially in their connection with the hadronic light-by-light contribution to the muon g-2. A particular aspect which is still a matter of debate concerns their double-virtual behavior, for which experimental data would be extremely welcomed in any theoretical approach. A long-time proposed possibility is to study the double-Dalitz decays of pseudoscalar mesons. Still, given the mild effect that TFFs play in these decays, a thorough investigation of NLO radiative corrections is extremely important. In our study, we revise the existing calculation and complete the—so far missing—full NLO calculation, finding some discrepancies which could be of relevance for existing and projected pseudocalar meson factories. The calculations can also be used for the crossing-related process, $e^+e^- \to e^+e^-P$, where future measurements are foreseen.

Work based on arXiv:1801.06067 and selected for PRD Editors' Suggestion in March 2018 issue.

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