

Radiative corrections in Dalitz decays of π^0 , η and η' mesons

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Collaboration

Abstract content

We briefly summarize current experimental and theoretical results on the two important processes of the low energy hadron physics involving neutral pions: the Dalitz decay of π^0 and the rare decay $\pi^0 \rightarrow e^+e^-$. As novel results we present the complete set of radiative corrections to the Dalitz decays $\eta^{(\prime)} \rightarrow \ell^+\ell^-\gamma$ beyond the soft-photon approximation, i.e. over the whole range of the Dalitz plot and with no restrictions on the energy of a radiative photon. The corrections inevitably depend on the $\eta^{(\prime)} \rightarrow \gamma^*\gamma^{(*)}$ transition form factors. For the singly virtual transition form factor appearing e.g. in the bremsstrahlung correction, recent dispersive calculations are used. For the one-photon-irreducible contribution at the one-loop level (for the doubly virtual form factor), we use a vector-meson-dominance-inspired model while taking into account the η - η' mixing.

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