Title: Some aspects of low-energy QCD at the precision frontier
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Abstract: This thesis concentrates on some low-energy aspects of QCD, namely on those which are connected to the electromagnetic decays of lightest neutral pseudoscalar mesons. Calculations of radiative corrections to neutral pion decays (the Dalitz decay and the rare decay) and a novel model for the pion electromagnetic transition form factor are subjects discussed in the attached papers, which this work is based on. The associated theoretical aspects including Chiral Perturbation Theory or the large-N_c limit are introduced. We also discuss the complications which arise when the calculations of radiative corrections for $\eta^{(\prime)}$ Dalitz decays are performed. Some details about the collaboration with experiments which incorporate the calculation of the published corrections are provided. Last but not least, some techniques related to loop integrals are shown.

Keywords: Chiral Perturbation Theory, large-N_c limit, radiative corrections, pion electromagnetic transition form factor