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Puzzles in low-energy QCD

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Summary

Many of the quantities of interest at the precision frontier in particle physics require a good understanding of the low energy properties of the strong interaction. I intend to focus on the fact that applications of effective field theory methods usually involve two aspects: dependence on the quark masses and dependence on the momenta. On the one hand, I will review some of the work done in dispersion theory, which led to an improved understanding of the momentum dependence. On the other hand, some of the results gained by means of lattice methods concerning the quark mass dependence will be discussed. As an illustrative example, I plan to critically examine the puzzle encountered in recent evaluations of the sigma-term.

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