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Dressed Quark Mass Dependence of Pion and Kaon Form Factors
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The structure of hadrons is described well by the Nambu–Jona-Lasinio (NJL) model, which is a chiral effective quark theory of QCD. In this work we explore the electromagnetic structure of the pion and kaon using the three-flavor NJL model, including effects of confinement and a pion cloud at the quark level. In the calculation there is only one free parameter, which we take as the dressed light quark (u and d) mass. In the regime where the dressed light quark mass is approximately 0.25 GeV, we find that the calculated values of the kaon decay constant, current quark masses, and quark condensates are consistent with experiment and QCD based analyses. We also investigate the dressed light quark mass dependence of the pion and kaon electromagnetic form factors, where comparison with empirical data and QCD predictions also favors a dressed light quark mass near 0.25 GeV.

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