

XVth Quark Confinement and the Hadron Spectrum



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Form Factors of Light Pseudoscalar Mesons - A Schwinger-Dyson Equations Perspective

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Pseudoscalar mesons are the simplest quark-antiquark bound states. Understanding their internal structure is at least as important in comprehending the working of quantum chromodynamics as hydrogen atom was for understanding quantum electrodynamics. The Q^2 evolution of their electromagnetic and two-photon transition form factors from $Q^2 \rightarrow 0$ to its asymptotically large values helps us explore the infrared and ultraviolet behavior of quantum chromodynamics within one single observable. Schwinger-Dyson equations (SDEs) provide an ideal framework to study the fundamental internal degrees of a meson, i.e., quarks and gluons, as their derivation and structure requires no recourse to the coupling strength being small or large. Mesons being two-body bound states also require a relativistic Bethe-Salpeter equation (BSE) to study their internal structure. We adopt a coupled SDE/BSE based formalism to investigate light pseudoscalar meson form factors, making comparison with the experimental results whenever available and also discussing their implications for the tests of the Standard Model of particle physics.

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