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Neutral and charged pion Form Factors from double-dilaton HQCD model

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We compute the Form Factors of both neutral and charged pion using a non-perturbative running of the strong-coupling constant αs obtained using a double-dilaton Holographic QCD model. These form factors remain poorly understood in the intermediate-energy region, which marks the transition between low- and high-energy physics. In particular, experimental data for the neutral pion Form Factor exhibits a deviation from the expected asymptotic behavior, and the charged pion form factor remains comparatively less explored. To address these issues, we employ the pion distribution amplitude formalism to investigate the Form Factor behavior in this intermediate regime. Our results suggests that non-perturbative physics of the strong interaction is relevant even at energy
scales traditionally considered perturbative, implying that the perturbative regime could occur at higher energies than previously thought. Finally, our approach allows us to study isospin-breaking effects through the quadratic pion mass difference.

Collaboration

Primary author: CANCIO, Hector (IFAE, Barcelona)

Co-author: MASJUAN, Pere (IFAE, Barcelona)

Presenter: CANCIO, Hector (IFAE, Barcelona)

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