XVIII International Conference on Hadron Spectroscopy and Structure (HADRON2019)



Contribution ID: 170

Type: Parallel

Valence structures of light and strange mesons from the basis light-front quantization framework

Tuesday, 20 August 2019 17:20 (20 minutes)

We apply the basis light-front quantization framework to solve for the structures of mesons with light and strange valence quarks. Our approach treats mesons as relativistic bound states with quarks confined in both the transverse direction and the light-front longitudinal direction. The spin-orbit interactions of these confined quarks are further specified by the Nambu–Jona-Lasinio model. We address the U(1) axial anomaly by including the Kobayashi-Maskawa-' t Hooft interaction regularized by our basis. We present the structures of the pion, the kaon, the eta meson, and the eta-prime meson in terms of their valence light-front wave functions obtained from the eigenvalue problem of our light-front Hamiltonian.

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Session Classification: Session 6: QCD and hadron structure

Track Classification: Session 6: QCD and hadron structure