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**Light mesons within the basis light-front quantization framework**[1]
WENYANG QIAN, SHAOYANG JIA, YANG LI, JAMES VARY, Iowa State University — We study the light-unflavored mesons as relativistic bound states in the nonperturbative Hamiltonian formalism of the basis light-front quantization (BLFQ) approach. The dynamics for the valence quarks of these mesons is specified by an effective Hamiltonian containing the one-gluon exchange interaction and the confining potentials both introduced in our previous work on heavy quarkonia, supplemented additionally by a pseudoscalar contact interaction. We diagonalize this Hamiltonian in our basis function representation to obtain the mass spectrum and the light-front wave functions (LFWFs). Based on these LFWFs, we then study the structure of these mesons by computing the electromagnetic form factors, the decay constants, the parton distribution amplitudes (PDAs), and the parton distribution functions (PDFs). In particular, we investigate the QCD evolution of the PDA and the PDF for the ground state of the pion, and compare our results with available experiments and other theoretical models.

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