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## Towards a first principles light-front Hamiltonian for light mesons

We obtain the light meson mass spectroscopy and wave functions from the light-front quantum chromodynamics

Hamiltonian for the first time, using a fully relativistic and nonperturbative approach based on light-front quantization, without an explicit confining potential. These eigenstates are determined for their constituent quark-antiquark, quark-antiquark-gluon and quark-antiquark-quark-antiquark Fock representations, making them

suitable for low-resolution probes. From this, we calculate the pion and kaon electromagnetic form factors, decay

constants, and quark and gluon matter densities, which show qualitative consistency with experimental extractions.

The obtained light-front wave functions represent a significant advancement towards a unified description of various hadronic distribution functions in both longitudinal and transverse momentum space.

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