Contribution ID: **36** Type: **Talk**

Pion momentum distributions in Minkowski space

Thursday 15 June 2023 14:45 (45 minutes)

We present a dynamical model for the pion based on the solution of the Bethe-Salpeter equation in Minkowski space. The masses of quark and gluon as well as the interaction-vertex scale have been chosen in a range suggested by lattice-QCD calculations, and calibrated to reproduce both pion mass and decay constant. Within this model, we obtain the valence probability, the LF-momentum distributions, the distribution amplitudes, the probability densities both in the LF-momentum space and the 3D space given by the Cartesian product of the covariant Ioffe-time and transverse coordinates [1] and the pion electromagnetic form factor, with a good agreement with available experimental data [2]. In addition, we obtain the parton distribution function [3] and show that, after performing an evolution with an effective charge and a LO splitting function, our outcomes agree with the extracted experimental data (with resummation effects). Finally, the unpolarized twist-2 (leading) and twist-3 (subleading), T-even, transverse-momentum dependent quark distributions in the pion are evaluated [4].

References:
1.W. de Paula, E. Ydrefors, J. H. Alvarenga Nogueira, T. Frederico and G. Salme, Phys. Rev. D 103 (2021) no.1, 0140022. E. Ydrefors, W. de Paula, J. H. A. Nogueira, T. Frederico and G. Salme, Phys. Lett. B 820 (2021), 136494
3. W. de Paula, E. Ydrefors, J. H. Alvarenga Nogueira, T. Frederico and G. Salme, Phys. Rev. D 105 (2022) L071505
4. E. Ydrefors, W. de Paula, T. Frederico and G. Salme, arXiv:2301.11599

Author: Prof. DE PAULA, wayne (Instituto Tecnologico de Aeronautica)

Presenter: Prof. DE PAULA, wayne (Instituto Tecnologico de Aeronautica)

Session Classification: Thursday Afternoon Session