

## Pion parton distribution function in Minkowski space

*Thursday 5 May 2022 10:40 (20 minutes)*

In this contribution, I will present a novel dynamical model for the pion based on the solution of the Bethe-Salpeter equation in Minkowski space. Our approach considers the pion as a bound state of a pair quark anti-quark interacting through the one-gluon exchange. The inputs of the model are the quark and gluon masses, and a scale parameter related to the extended quark-gluon vertex. Within this model, we obtain the full parton distribution function (PDF) directly in Minkowski space, as well as the contribution from the light-front valence state. We also present a comparison with experimental data, after evolving the PDF at the initial scale. In addition, we compute other hadronic observables, as the pion weak decay constant, the valence probability, the LF-momentum distributions, the distribution amplitude, the probability densities both in the LF-momentum space and in the 3D space given by the Cartesian product of the covariant Ioffe-time and transverse coordinates [1]. Furthermore, we show results for the pion electromagnetic form factor which presents a good agreement with available experimental data [2].

References:

1. W. de Paula, E. Ydrefors, J. H. Alvarenga Nogueira, T. Frederico and G. Salme, Phys. Rev. D 103 (2021) no.1, 014002
2. E. Ydrefors, W. de Paula, J. H. A. Nogueira, T. Frederico and G. Salme, Phys. Lett. B 820 (2021), 136494

### Submitted on behalf of a Collaboration?

No

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**Session Classification:** WG1: Structure Functions and Parton Densities

**Track Classification:** WG1: Structure Functions and Parton Densities