LATTICE 21
JULY 26-30 2021, ZOOM/GATHER@MIT

Contribution ID: **154** Type: **Oral presentation**

Double parton distributions in the nucleon from lattice simulations

Wednesday, 28 July 2021 05:15 (15 minutes)

We provide a first study of Mellin moments of double parton distributions (DPDs) in the nucleon on the lattice, where we consider several combinations of quark flavors and polarizations. These are accessible through two-current correlations, which can be obtained by evaluating four-point functions. In this context we consider all possible Wick contractions, where for almost all of them sufficiently clear signals are obtained. In the present study, we employ an $n_f = 2 + 1$ CLS ensemble on a 96×32^3 lattice with lattice spacing $a = 0.0856$ fm and the pseudoscalar masses $m_\pi = 355$ MeV and $m_K = 441$ MeV.

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Session Classification: Hadron Structure

Track Classification: Hadron Structure