

## Pion and kaon transverse momentum-dependent parton distribution functions in lattice QCD

We evaluate the transverse momentum-dependent parton distribution functions for the pion and kaon by computing the quasi-beam functions with asymmetric staple-shaped quark bilinear operators and combine it with the soft function and Collins-Soper kernels. These are computed within lattice QCD using an  $\mathcal{N}_f = 2 + 1 + 1$  twisted mass fermion ensemble of lattice size  $24^3 \times 48$ , lattice spacing  $a = 0.093$  fm, pion mass of 350 MeV and kaon mass of 554 MeV. We study the mixing pattern of the extended operators composed of an asymmetric staple-shaped Wilson line through symmetry arguments and implement non-perturbative renormalization within both the RI/MOM scheme and a variant scheme, where the renormalization factors are computed at short distances.

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