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Connecting Euclidean to lightcone correlations: From forward to non-forward kinematics

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According to large momentum effective theory (LaMET), the parton observables can be extracted from lattice calculations of quasi-observables through a perturbative matching relation. In this talk, I present a unified framework for the perturbative factorization connecting Euclidean correlations to light-cone correlations. We derive the flavor singlet and non-singlet matching kernel for the generalized distribution functions (GPDs), parton distribution functions (PDFs) and distribution amplitudes (DAs) at one-loop level, including the unpolarized, longitudinally and transversely polarized cases. Our results provide a manual for extracting all leading-twist GPDs, PDFs as well as DAs from lattice simulations of Euclidean correlations, following the state-of-the-art renormalization and matching strategy, either in coordinate or in momentum space factorization approach.

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