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Renormalizing the Quasi-PDF Operator under Lattice Regularization YUSHAN SU, University of Maryland, College Park, YI-KAI HUO, Columbia University, LONG-CHENG GUI, Hunan Normal University, XIANGDONG JI, University of Maryland, College Park, YUAN-YUAN LI, Nanjing Normal University, MAXIMILIAN SCHLEMMER, Universitt Regensburg, PENG SUN, Nanjing Normal University, YI-BO YANG, Chinese Academy of Sciences, KUAN ZHANG, University of Chinese Academy of Sciences, LATTICE PARTON COLLABORATION COLLABORATION — In large-momentum effective theory, renormalization of the Euclidean operators in lattice regularization is a challenge due to the linear divergences in the self-energy of Wilson lines. Based on the Lattice QCD matrix elements of the quasi-PDF operator at a= 0.03fm $\sim$ 0.12 fm with clover and overlap valence quarks on staggered and domain-wall sea, we design a strategy to disentangle the divergent renormalization factors from finite physics matrix elements which can be matched to a continuum scheme at short distance such as dimensional regularization and minimal subtraction. Our results indicate that the renormalization factors are universal in the chiral fermion formalism but not in the clover case. However, the physical matrix elements appear independent of the valence fermion formulations. Moreover, we find a large non-perturbative effect in the popular RI/MOM and ratio renormalization scheme used previously, which supports the hybrid renormalization procedure proposed recently.

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