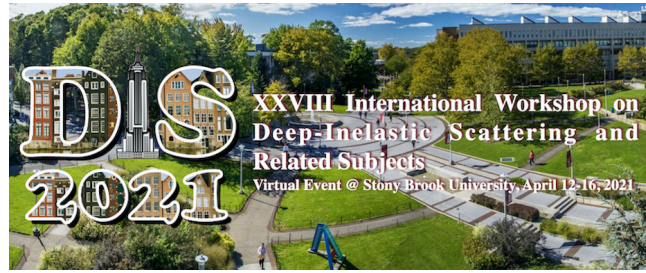


XXVIII International Workshop on Deep-Inelastic Scattering and Related Subjects



Contribution ID: 497

Type: **Recorded Flash Talk**

Towards stability of NLO corrections for DIS-like processes in High-Energy Factorization

The NLO corrections to DIS-like process, initiated by gauge-invariant operator $\text{tr}[G_{\mu\nu}G^{\mu\nu}]$ (Where $G_{\mu\nu}$ is field-strength tensor of QCD) had been studied in Refs. [1,2], including one-loop and real-emission NLO corrections. This “Higgs-initiated DIS” process is a simplest small- x physics process for which it is most convenient to study problem of convergence of perturbative series, which arises in High-Energy Factorization (k_T -factorization) at NLO. In the standard BFKL-type NLO calculation (called “MRK-subtraction” in Ref. [2]) the usual over-subtraction problem in collinear region of NLO correction is found. An improved “modified-MRK (MMRK) approximation”, interpolating between MRK and collinear limits of scattering amplitude, is proposed to solve the over-subtraction problem. The evolution equation based on MMRK approximation is proposed [2] and studied. The improved physical behavior of NLO correction with MMRK subtraction is demonstrated [2].

References:

[1] M.A. Nefedov, Computing one-loop corrections to effective vertices with two scales in the EFT for Multi-Regge processes in QCD, Nucl. Phys. B 946, 114715 (2019) doi:10.1016/j.nuclphysb.2019.114715 [arXiv:1902.11030 [hep-ph]].

[2] M.A.Nefedov, Towards stability of NLO corrections in High-Energy Factorization via Modified Multi-Regge Kinematics approximation, JHEP 08, 055 (2020) doi:10.1007/JHEP08(2020)055 [arXiv:2003.02194 [hep-ph]].

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Session Classification: Recorded Flash Talk

Track Classification: Small- x , Diffraction and Vector Mesons