Challenges of the collinearly improved JIMWLK evolution equation

poster presentation

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Computational Elementary Particle Physics group at JU

Precision for phenomenology

- Standard Model parameters from Lattice QCD: $\Lambda_{\mathrm{QCD}}^{N_f=3}$
  Phys.Rev.Lett. 125 (2020) 242002

Lattice QCD

- improvement coefficients for CLS simulations
  Phys.Rev.D 95 (2017) 1, 014505

CGC, small-x physics and the JIMWLK evolution equation

- calculation of Transverse Momentum Dependent structure functions
  Eur.Phys.J.C 82 (2022) 369, SoftwareX 16 (2021) 100887
  Eur.Phys.J.C 81 (2021) 663

Machine learning and new algorithms

- Hierarchical Autoregressive NN approach to stat. systems
  Comput.Phys.Commun. 281 (2022) 108502

Beyond the SM physics

- numerical simulations of models with higher gauge symmetries
  JHEP 09 (2021) 068

Challenges of the collinearly improved JIMWLK equation

Intriguing questions

- origin of hadron spin
- existence of saturated/high gluon density regime of QCD

Necessary elements

- precise determination of various TMD structure functions (beyond the gluon dipole amplitude)

Solution

- unified framework for solving BK and JIMWLK evolution using logarithmic lattices including the kinematical constraint
- multi-observable fit to experimental data

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