



DISSERTATION DEFENSE

Wayne Morris

"Investigating Gluonic Operators in Coordinate Space"

10:00 am

Friday, March 18, 2022

Abstract:

In this dissertation, a method of extracting gluon momentum distributions inside hadrons, and particularly nucleons, is developed. In general, the utility and application of performing calculations in coordinate space at the operator level is discussed, and its application to the method of pseudodistributions in the lattice extraction of parton distributions. An introduction to the background field method and other techniques used in the calculation of corrections to gluon operators are provided. Then, an outline of the calculation of the uncontracted gluon bilocal operator at one-loop is given, and the result thereof. Using the result for the gluon bilocal operator restricted to spacelike separations, $z=(0,0,0,z_3)$, various projections and contractions are discussed for the spin averaged case, and for the polarization dependent case in a forward nucleon matrix element. Finally, matching relations between pseudodistributions and lightcone distributions are given for the unpolarized gluon distribution and for the polarized gluon distribution. Application of the results in recent actual lattice extractions of gluon PDFs is discussed, and future applications are outlined.

See zoom information below

Wayne Morris
March 18, 2022
10:00 AM
"Investigating Gluonic Operators in Coordinate Space"

Zoom Info:

<https://odu.zoom.us/j/95872008951?pwd=TnRaeTBya3VGbFFLaEtkSUJwYmlGQTo9>

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213.19.144.110 (Amsterdam Netherlands)

213.244.140.110 (Germany)

103.122.166.55 (Australia Sydney)

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149.137.40.110 (Singapore)

64.211.144.160 (Brazil)

149.137.68.253 (Mexico)

69.174.57.160 (Canada Toronto)

65.39.152.160 (Canada Vancouver)

207.226.132.110 (Japan Tokyo)

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All interested persons are cordially invited to attend.