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CiSE Computational Physics Challenge Winner: Fast parton evolution and the search for gluon asymmetry in the hadron with PartonKit
YEVGENY BINDER, Loyola University Chicago, GORDON RAMSEY, Loyola University Chicago / Argonne National Laboratory — In the search for well-defined structure in the hadron, deep inelastic scattering (DIS) provides experimental data for a portion of the $J_z = \frac{1}{2}$ sum rule. For all terms to be fully determined, it is necessary to derive the longitudinally polarized gluon distribution from unpolarized DIS experiments, as well as from theoretical modeling and parton evolution. We have created a new computer program to perform parton evolution using the method devised by G. Rossi, which provides fast, stable results while remaining in x-space. Using this program, we have found a preliminary range of viable gluon asymmetries, which generate polarized gluon distributions.

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