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Flash-4: Longitudinal structure of the initial state from 3+1D CGC simulations

Friday 15 January 2021 18:40 (5 minutes)

We develop a framework to simulate the 3+1D dynamics of the initial energy deposition in heavy-ion collisions by taking into account the finite longitudinal extent of the colliding nuclei in the Color-Glass Condensate framework. Based on a simple model for the color charge distributions of the colliding nuclei, we demonstrate how the boost-invariant limit is recovered at high energies along with certain contrasting results that signify deviation from the high energy limit. We then develop a physical model of the three-dimensional color charge distributions in terms of small- x TMDs and study the non-trivial rapidity profile and the longitudinal fluctuations that emerge naturally within our framework.

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