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Modeling pp-collision using DIS model of the proton from HERA

Content :

Inclusive gluon production in p+p collisions at LHC energy is studied in the CGC framework. Dipole-models based on various saturation scenarios provide reasonable fits to small-x DIS inclusive, diffractive and exclusive data from HERA. Proton unintegrated gluon distributions extracted from such fits, when combined with kT -factorization, is employed to calculate inclusive gluon distributions at various energies. We estimate quantities like pseudo-rapidity and transverse momentum distribution of charge hadrons using parameter sets that best fit the HERA data and compare with recent LHC results. We find considerable agreement of various estimated quantities with experimental data over wide range of different kinematic variables. High multiplicity events are well explained in our approach and calculated probability distribution of multiplicity shows reasonable agreement with LHC data. Our result also shows that the dominant contribution to multiplicity fluctuations arises from intrinsic fluctuations of gluon production from multiple glasma flux tubes rather than from the fluctuating geometry of the p+p collision. The spatial variation of the saturation scale gives rise to a spatial anisotropy of the initial gluon density within the overlap zone of the p+p collision. We estimate in our framework v_2 for high multiplicity pp collision events at the LHC.

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