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Strong Color Fields in Nuclei from Fits to Nuclear Parton Distributions

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We consider a modified version of the McLerran-Venugopalan model where the thickness of the nucleus is finite and infrared divergences are removed by the color neutrality condition. The strong coupling constant and the nucleon size are treated as parameters. To determine these parameters, the x -dependent gluon distribution function is calculated at very low momentum, which is the region of validity of this model. The resulting distribution function is evolved with the DGLAP equation to higher momenta by using the QCDNUM package and compared with data as parametrized by nuclear CTEQ. This allows us to infer the parameters, and hence to calculate the classical color fields representing the initial conditions in high energy heavy-ion collisions without any free parameters.

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