Nuclear effects in Drell-Yan dilepton production in proton-nucleus collisions

B.Z. Kopeliovich [a,d] J. Raufeisen [b] A.V. Tarasov [c,d]

[a] *MPI für Kernphysik, Heidelberg, Germany*

[b] *Physics Division, LANL, Los Alamos, New Mexico*

[c] *Institut für Theoretische Physik der Universität, Heidelberg, Germany*

[d] *JINR, Dubna, Russia*

Presented by: J. Raufeisen

Abstract

In the target rest frame and at high energies, Drell-Yan (DY) dilepton production looks like bremsstrahlung of massive photons, rather than parton annihilation. After Fourier-transforming to impact parameter space, the DY cross section can be expressed in terms of the same color dipole cross section as DIS. This approach is especially suitable to describe nuclear effects, since it allows to apply Glauber multiple scattering theory. We go beyond the Glauber eikonal approximation and take the motion of the incident quark in the transverse plane into account. We calculate nuclear shadowing at large Feynman-x_F for DY in proton-nucleus collisions, compare to existing data from E772 and make predictions for RHIC. Nuclear effects on the transverse momentum distribution are also investigated.

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