Perturbative Part of the Non-Singlet Structure Function F_2 in the Large-N_F Limit ◇

L. Mankiewicz, M. Maul[a], and E. Stein[a]

[a] Institut für Theoretische Physik, J.-W.-v.-Goethe-Universität Frankfurt, Germany

We have calculated $\bar{M}S$ Wilson coefficients and anomalous dimensions for the non-singlet part of the structure function F_2 in the large-N_F limit. Our result agrees with exact two and three loop calculations and gives the leading N_F dependence of the perturbative non-singlet Wilson coefficients to all orders in α_s.

◇ Supported by BMBF project 06 TM 743(6)

Feynman Diagram Approach to High-Energy Scattering from Lightest Nuclei ◇

L. Frankfurt[a,b], G. Piller, M. Sargsian, and M. Strikman[c,b]

[a] School of Physics and Astronomy, Tel Aviv University, Tel Aviv 69978, Israel
[c] Department of Physics, Pennsylvania State University, University Park, PA 16802, USA
[b] Institute for Nuclear Physics, St. Petersburg, Russia

We outline a Feynman diagram approach to high-energy scattering from the lightest nuclei. It allows to describe high-energy (semi-)exclusive nuclear reactions at large recoil energies. In such processes the conventional Glauber approach is not applicable. This is demonstrated for high-Q^2 nucleon knock-out processes and vector-meson electroproduction.

◇ Supported by German-Israeli Foundation, Alexander von Humboldt Foundation, DOE grant and BMBF project 06 TM 876

Diffractive Phenomena and Shadowing in Deep-Inelastic Scattering ◇

G. Piller, G. Niesler, and W. Weise

Shadowing effects in deep-inelastic lepton-nucleus scattering probe the mass spectrum of diffractive leptoproduction from individual nucleons. We explore this relationship using current experimental information on both processes. In recent data from the NMC and E665 collaboration, taken at small $x << 0.1$ and $Q^2 << 1GeV^2$ as discussed at HERA, the situation is different. Here dominant contributions come from the coherent interaction of diffractively produced heavy mass states. Furthermore we observe that the energy dependence of shadowing is directly related to the mass dependence of the diffractive production cross section for free nucleon targets.

published in Z. Physik **A358** (1997) 407

◇ Supported by BMBF project 06 TM 743(6)