Nuclear Effects in Deep-Inelastic Lepton Scattering ◇

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We discuss nuclear effects in deep-inelastic lepton scattering. At small values of the Bjorken variable $x < 0.1$ shadowing effects are due to the coherent interaction of hadronic Fock components of the exchanged, virtual photon. It turns out that in the kinematic regime of current experiments the contribution of vector mesons are of major importance. At moderate and large $x < 0.2$ nuclear effects are caused by binding and Fermi motion, but also by off-shell modifications of bound nucleon structure functions.

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Effective Lagrangian Approach to Vector Mesons, their Structure and Decays ◇

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An improved update of the structure and decays of ρ^0, ω and ϕ mesons based on a chiral $SU(3)$ Lagrangian, including anomaly terms is presented. We demonstrate that a consistent and quantitatively successful description of both pion and kaon electromagnetic form factors can be achieved. We also discuss the $e^+e^- \to \pi^+\pi^0\pi^-$ cross section, the Dalitz decay $\omega \to \pi^0\mu^+\mu^-$ and aspects of $\rho^0\omega$ and $\omega\phi$ mixing. Relations to previous versions of the Vector Meson Dominance model will be examined.

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MC Simulation of Vector Boson Production in Polarized Proton Collisions ◇

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We present a Monte Carlo (MC) study of $W^\pm$ and Z_0 production of longitudinally polarized proton collisions at a center of mass (CMS) energy of 500 GeV. All results were obtained with the SPHINX MC code. We consider two different types of polarized parton distributions with large and small gluon polarization. Various spin asymmetries are found to be sensitive to the shape of the polarized gluon distribution between $0.1 < x < 0.5$. The asymmetries are approximately constant with respect to the transverse momentum carried by the $W^\pm$ and Z_0, except if the first momentum of the gluon polarization is large. In this case some $W^\pm$ asymmetries show a significant variation with transverse momentum.

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