Structure of the Constituent Quark and Quark Distributions of Hadrons

K. Suzuki

We study the structure of constituent quarks by dressing bare quarks with the Goldstone bosons and its implications for quark distribution functions of hadrons $f_1(x)$, $g_1(x)$ and $h_1(x)$. In particular we discuss effects of the dressing on the nucleon spin structure, and find that contributions to chiral-odd $h_1(x)$ is quite different from those to $g_1(x)$, which can be measured in the semi-inclusive polarized deep inelastic scattering.

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Coherent Photo and Lepto Production of Vector Mesons from Deuterium ◇

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We discuss the coherent photo- and leptoproduction of vector mesons from deuterium at intermediate (virtual) photon energies, $3GeV < v < 30GeV$. These processes provide several options to explore the space-time evolution of small size quark-gluon configurations. Furthermore, we study the dependence of the production cross section on the energy and momentum transfer t due to variations of the finite longitudinal interaction length. Kinematic regions are determined where the production cross section is most sensitive to the final state interaction of the initially produced hadronic wave packet. For unpolarized deuteron targets this double scattering contribution can be investigated mainly at large values of the momentum transfer t. We suggest several methods for an investigation of color coherence effects at intermediate energies.

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Color Coherence Effects in Coherent Vector Meson Production ◇

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We discuss the coherent leptoproduction of vector mesons from deuterium as a tool to investigate the evolution of small-size quark-gluon configurations. For this purpose kinematic regions are determined where the final state interaction of the initially produced quark-gluon wave packet contributes dominantly to the production cross section.

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