Axial $U(1)$ Dynamics in η and η' Photoproduction ◇

S.D. Bass, S. Wetzel, and W. Weise

We discuss the sensitivity of η and η' photoproduction near threshold to the gluonic OZI breaking parameters in the $U_A(1)$-extended effective chiral Lagrangian for low-energy QCD. Our coupled-channels analysis hints at a strong correlation between the gluon-induced contributions to the η' mass and the low-energy $pp \to pp\eta'$ reaction and the near-threshold behaviour of the $\gamma p \to \eta p$ cross-section.

to be published in Nucl. Phys. A

◇ *Supported in part by BMBF project 06 TM 980 and DFG project We 655/14-2*

Chiral 3π-Exchange NN-Potentials: Results for Representation-Invariant Classes of Diagrams ◇

N. Kaiser

We calculate in (two-loop) chiral perturbation theory the local NN-potentials generated by certain classes of three-pion exchange diagrams. We stress that the chiral $3\pi NN$-contact vertex depends on the particular choice of the interpolating pion-field and therefore one has to consider representation invariant classes of diagrams by supplementing graphs involving the chiral 4π-vertex. We find that the isovector spin-spin and tensor NN-potentials resulting from these diagrams are negligibly small for $r \geq 0.8$ fm.

published in Phys. Rev. C 61 (2000) 014003

◇ *Work supported in part by DFG project We 655/14-2*

Coherence Effects in Diffractive Electroproduction of ρ Mesons from Nuclei ◇

T. Renk, G. Piller, and W. Weise

A systematic multiple scattering formalism for vector meson electroproduction from nuclei is developed with emphasis on the formation, propagation and hadronization scales for quark-gluon fluctuations of the virtual high-energy photon. The theory is compared to HERMES measurements of ρ electroproduction on ^{14}N. The nuclear transparency as a function of the vector meson propagation length is well reproduced.

to be published in Nucl. Phys. **A**

◇ *Supported in part by grants from BMBF and DFG*

g_1 at low x and low Q^2 with Polarized ep Colliders ◇

S.D. Bass and A. de Roeck [a]
[a] CERN, 1211 Geneva 23, Switzerland

Measurements of g_1 at low x and low Q^2 are expected to provide a sensitive probe of the transition from Regge to perturbative QCD dynamics, offering a new testing ground for models of small x physics. We discuss the potential of polarized ep colliders (Polarized HERA and eRHIC) to investigate this physics — varying Q^2 between 0.01 and $1\,GeV^2$ — and to constrain the high-energy part of the Drell-Hearn-Gerasimov sum-rule for polarized photoproduction.

to be published in Eur. Phys. J. C

◇ *Supported in part by DFG project We 655/14-2*