Selected Abstracts from Other Physical Review Journals

Abstracts of papers which are published in **other Physical Review journals** *and may be of interest to Physical Review C readers are printed here. The Editors of Physical Review C routinely scan the abstracts of* **Physical Review D** *papers. Appropriate abstracts of papers in other Physical Review journals may be included upon request.*

Structure functions are not parton probabilities. Stanley J. Brodsky,[1] Paul Hoyer,[2] Nils Marchal,[2,3] Stéphane Peigné,[3] and Francesco Sannino[2] [1]*Stanford Linear Accelerator Center, Stanford, California 94309,* [2]*Nordita, Blegdamsvej 17, DK–2100 Copenhagen, Denmark,* [3]*LAPTH, Boîte Postale 110, F-74941 Annecy-le-Vieux Cedex, France.* (Received 28 April 2001; revised manuscript received 21 February 2002; published 27 June 2002)

The common view that structure functions measured in deep inelastic lepton scattering are determined by the *probability* of finding quarks and gluons in the target is not correct in gauge theory. We show that gluon exchange between the fast, outgoing partons and target spectators, which is usually assumed to be an irrelevant gauge artifact, affects the leading twist structure functions in a profound way. This observation removes the apparent contradiction between the projectile (eikonal) and target (parton model) views of diffractive and small x_B phenomena. The diffractive scattering of the fast outgoing quarks on spectators in the target causes shadowing in the DIS cross section. Thus the depletion of the nuclear structure functions is not intrinsic to the wave function of the nucleus, but is a coherent effect arising from the destructive interference of diffractive channels induced by final state interactions. This is consistent with the Glauber-Gribov interpretation of shadowing as a rescattering effect. [Phys. Rev. D **65**, 114025 (2002)]

Improved smoothing algorithms for lattice gauge theory. Frédéric D. R. Bonnet, Derek B. Leinweber, Anthony G. Williams, and James M. Zanotti, *Special Research Center for the Subatomic Structure of Matter (CSSM) and Department of Physics and Mathematical Physics, University of Adelaide 5005, Australia.* (Received 5 July 2001; published 27 June 2002)

The relative smoothing rates of various gauge field smoothing algorithms are investigated on $\mathcal{O}(a^2)$-improved SU(3) Yang-Mills gauge field configurations. In particular, an $\mathcal{O}(a^2)$-improved version of APE smearing is motivated by considerations of smeared link projection and cooling. The extent to which the established benefits of improved cooling carry over to improved smearing is critically examined. We consider representative gauge field configurations generated with an $\mathcal{O}(a^2)$-improved gauge field action on $16^3\times 32$ lattices at $\beta=4.38$ and $24^3\times 36$ lattices at $\beta=5.00$ having lattice spacings of 0.165(2) fm and 0.077(1) fm, respectively. While the merits of improved algorithms are clearly displayed for the coarse lattice spacing, the fine lattice results put the various algorithms on a more equal footing and allow a quantitative calibration of the smoothing rates for the various algorithms. We find the relative rate of variation in the action may be succinctly described in terms of simple calibration formulas which accurately describe the relative smoothness of the gauge field configurations at a microscopic level. [Phys. Rev. D **65**, 114510 (2002)]