

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.

Super-Kamiokande data and atmospheric neutrino decay. G. L. Fogli, E. Lisi, A. Marrone, and G. Scioscia, *Dipartimento di Fisica and Sezione INFN di Bari, Via Amendola 173, I-70126 Bari, Italy*. (Received 8 February 1999; published 11 May 1999)

Neutrino decay has been proposed as a possible solution to the atmospheric neutrino anomaly, in light of recent data from the Super-Kamiokande experiment. We investigate this hypothesis by means of a quantitative analysis of the zenith angle distributions of neutrino events in Super-Kamiokande, including the latest (45 kTy) data. We find that the neutrino decay hypothesis fails to reproduce the observed distributions of muons. [S0556-2821(99)01713-0] [Phys. Rev. D **59**, 117303 (1999)]

Relativistic Wigner function approach to neutrino propagation in matter. M. Sirera and A. Pérez, *Departamento de Física Teórica, Universidad de Valencia, E-46100 Burjassot, Valencia, Spain*. (Received 13 October 1998; published 14 May 1999)

In this work we study the propagation of massive Dirac neutrinos in matter with flavor mixing, using statistical techniques based on relativistic Wigner functions. First, we consider neutrinos in equilibrium within the Hartree approximation, and obtain the corresponding dispersion relations and effective masses. After this, we analyze the same system out of equilibrium. We verify that, under the appropriate physical conditions, the well-known equations for the MSW effect are recovered. [S0556-2821(99)05712-4] [Phys. Rev. D **59**, 125011 (1999)]

Another look at “just-so” solar neutrino oscillations. James M. Gelb, *Department of Physics, University of Texas at Arlington, Arlington, Texas 76019*; S. P. Rosen, *U.S. Department of Energy, Germantown, Maryland 20874*. (Received 24 September 1998; revised manuscript received 24 December 1998; published 3 June 1999)

We take another look at “just-so” solar neutrino oscillations, characterizing them by the energy $E_{\pi/2}$ at which the distance-varying angle is $\pi/2$, instead of by the usual Δm^2 . The rising spectrum recently observed by the SuperKamiokande Collaboration is consistent with an $E_{\pi/2} \sim 6-9$ MeV and marginally with 48 MeV. The pp neutrinos must then be reduced to one-half the standard solar model prediction, and ${}^7\text{Be}$ neutrinos must make up a significant part of the SAGE and GALLEX gallium signal. For $E_{\pi/2}$ close to 9 and 48 MeV, the ${}^7\text{Be}$ neutrinos will also show a large seasonal variation, emphasizing the importance of direct measure-

ments of the ${}^7\text{Be}$ neutrinos. [S0556-2821(99)50213-0] [Phys. Rev. D **60**, 011301 (1999)]

Exotic solutions of the atmospheric neutrino problem. Paolo Lipari and Maurizio Lusignoli, *Dipartimento di Fisica, Università di Roma “la Sapienza,” and I.N.F.N., Sezione di Roma, P. A. Moro 2, I-00185 Roma, Italy*. (Received 20 January 1999; published 26 May 1999)

The measurements of the fluxes of atmospheric neutrinos give evidence for the disappearance of muon neutrinos. The determination of the dependence of the disappearance probability on the neutrino energy and trajectory allows one, in principle, to establish unambiguously the existence of neutrino oscillations. Alternative mechanisms for the disappearance of the neutrinos have been proposed, but do not provide a viable description of the data, if one includes both events where the neutrinos interact in the detector and ν -induced upward going muons. The proposed mechanisms differ in the energy dependence of the disappearance probability, and the upward going muon data that are produced by high-energy neutrinos give a crucial constraint.

[S0556-2821(99)04311-8] [Phys. Rev. D **60**, 013003 (1999)]

Hard exclusive pseudoscalar meson electroproduction and spin structure of the nucleon. L. L. Frankfurt,^{1,2} P. V. Pobylitsa,^{2,3} M. V. Polyakov,^{2,3} and M. Strikman,^{2,4} ¹*Physics Department, Tel Aviv University, Tel Aviv, Israel* ²*Petersburg Nuclear Physics Institute, Gatchina, Russia* ³*Institut für Theoretische Physik II, Ruhr-Universität Bochum, D-44780 Bochum, Germany* ⁴*Department of Physics, Pennsylvania State University, University Park, Pennsylvania 16802 and Deutsches Elektronen Synchrotron DESY, Hamburg, Germany*. (Received 5 February 1999; published 4 June 1999)

The amplitude for hard exclusive pseudoscalar meson electroproduction off nucleon (nuclear) targets is computed in QCD within the leading $\alpha_s \ln Q^2 / \Lambda_{QCD}^2$ approximation. We show that the distribution of recoil nucleons depends strongly on the angle between the momentum of the recoil nucleon and the polarization vector of the target (or outgoing nucleon). This dependence is especially sensitive to the spin flip skewed parton distribution (SPD) $\tilde{E}$. We argue also that the scaling for this spin asymmetry sets in at lower Q^2 than that for the absolute cross section. Based on the chiral quark-soliton model of the nucleon we estimate quantitatively the spin asymmetry. In the case of π^+ production this asymmetry is dominated at small t by the contribution of the pion pole in the isovector SPD $\tilde{E}$ as required by PCAC. In the case of K^0 production off a proton we find a large enhancement of the cross section as compared to the

case of π^0 production. For the forward production of neutral pseudoscalar mesons off a deuteron target we find the cross section should be zero for the zero deuteron helicity (along the γ^*D direction). We consider also cross sections of quasielastic processes off nuclei including the feasibility to implant K^+ , ρ mesons into nuclear volume.

[S0556-2821(99)05111-5] [Phys. Rev. D **60**, 014010 (1999)]

Two-point correlation function with a pion in QCD sum rules.

Hungchong Kim, *Department of Physics, Tokyo Institute of Technology, Tokyo 152-8551, Japan*; Su Houng Lee, *GSI, Planckstrasse 1, D-64291 Darmstadt, Germany and Department of Physics, Yonsei University, Seoul 120-749, Korea*; Makoto Oka, *Department of Physics, Tokyo Institute of Technology, Tokyo 152-8551, Japan*. (Received 10 November 1998; published 22 June 1999)

Within the framework of the conventional QCD sum rules, we study the pion two-point correlation function $i \int d^4x e^{iq \cdot x} \langle 0 | T J_N(x) \bar{J}_N(0) | \pi(p) \rangle$ beyond the soft-pion limit. We construct sum rules from the three distinct Dirac structures $i \gamma_5 \not{p}$, $i \gamma_5$, $\gamma_5 \sigma_{\mu\nu} q^\mu p^\nu$ and study the reliability of each sum rule. The sum rule from the third structure is found to be insensitive to the continuum threshold S_π and contains a relatively small contribution from the undetermined single pole which we denote as b . The sum rule from the $i \gamma_5$ structure is very different even though it contains

similar contributions from S_π and b as the ones coming from the $\gamma_5 \sigma_{\mu\nu} q^\mu p^\nu$ structure. On the other hand, the sum rule from the $i \gamma_5 \not{p}$ structure has a strong dependence on both S_π and b , which is clearly in contrast with the sum rule for $\gamma_5 \sigma_{\mu\nu} q^\mu p^\nu$. We identify the source of the sensitivity for each of the sum rules by making specific models for higher resonance contributions and discuss the implications. [S0556-2821(99)05413-2] [Phys. Rev. D **60**, 034007 (1999)]

Role of nucleons in electromagnetic emission rates. James V. Steele, *Department of Physics, The Ohio State University, Columbus, Ohio 43210*; Ismail Zahed, *Department of Physics and Astronomy, SUNY, Stony Brook, New York 11794*. (Received 25 January 1999; published 18 June 1999)

Electromagnetic emission rates from a thermalized hadronic gas are important for the interpretation of dilepton signals from heavy-ion collisions. Although there is a consensus in the literature about rates for a pure meson gas, qualitative differences appear with a finite baryon density. We show this to be essentially due to the way in which the πN background is treated in regards to the nucleon resonances. Using a background constrained by unitarity and broken chiral symmetry, it is emphasized that the thermalized hadronic gas can be considered dilute. [S0556-2821(99)02713-7] [Phys. Rev. D **60**, 037502 (1999)]