Selected Abstracts from Physical Review D

Abstracts of papers published in **Physical Review D** *which may be of interest to our readers are printed here.*

Neutral-strange-particle production in 200-GeV/c $p/\pi^+/K^+$ interactions on Au, Ag, and Mg. D. H. Brick[a] and M. Widgoff, *Brown University, Providence, Rhode Island 02912;* P. Beilliere, P. Lutz, and J. L. Narjoux, *College de France, Paris CEDEX 05, France;* N. Gelfand, *Fermilab, Batavia, Illinois 60510;* E. D. Alyea, Jr. *Indiana University, Bloomington, Indiana 47401;* M. Bloomer, J. Bober,[b] W. Busza, B. Cole, T. A. Frank,[c] T. A. Fuess, L. Grodzins, E. S. Hafen, P. Haridas, D. Huang,[d] H. Z. Huang, R. Hulsizer, V. Kistiakowsky, R. J. Ledoux, C. Milstene,[e] S. Noguchi,[f] S. H. Oh,[g] I. A. Pless, S. Steadman, T. B. Stoughton,[h] V. Suchorebrow,[i] S. Tether, P. C. Trepagnier,[j] B. F. Wadsworth, Y. Wu,[d] and R. K. Yamamoto, *Department of Physics and the Laboratory for Nuclear Science, Massachusetts Institute of Technology, Cambridge, Massachusetts, 02139;* H. O. Cohn, *Oak Ridge National Laboratory, Oak Ridge, Tennessee 37830;* E. Calligarich, G. Corti, R. Dolfini, G. Gianini, G. Introzzi, and S. Ratti, *University of Pavia and Istituto Nazionale di Fisica Nucleare, Pavia, Italy;* M. Badiak, R. DiMarco,[k] P. F. Jacques, M. Kalelkar, and R. J. Plano, *Rutgers University, New Brunswick, New Jersey 08903;* P. E. Stamer, *Seton Hall University, South Orange, New Jersey 07079;* E. B. Brucker and E. L. Koller, *Stevens Institute of Technology, Hoboken, New Jersey 07030;* G. Alexander, J. Grunhaus, and A. Levy, *Tel Aviv University, Ramat-Aviv, Israel 69978;* J. E. Brau, W. M. Bugg, G. T. Condo, T. Handler, H. J. Hargis, E. L. Hart, A. Rafatian, and A. H. Rogers, *University of Tennessee, Knoxville, Tennessee 37996;* T. Kitagaki, S. Tanaka, H. Yuta, K. Abe, K. Hasegawa, A. Yamaguchi, K. Tamai, Y. Hayaschino, and Y. Otani, *Tohoku University, Sendai, Japan;* M. Higuchi and M. Sato, *Tohoku Gakuin University, Tagajyo, Miyagi, Japan;* T. Ludlam,[l] R. Steiner,[m] and H. Taft[n], *Yale University, New Haven, Connecticut 06520*

(International Hybrid Spectrometer Consortium)
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We have used the Fermilab 30-in. bubble-chamber–hybrid spectrometer to study neutral-strange-particle production in the interactions of 200-GeV/c protons and π^+ and K^+ mesons with nuclei of gold, silver, and magnesium. Average multiplicities and inclusive cross sections for K^0 and Λ are measured, and a power law is found to give a good description of their A dependence. The exponent characterizing the A dependence is consistent with being the same for K^0 and Λ production, and also the same for proton and π^+ beams. Average K^0 and Λ multiplicities, as well as their ratio, have been measured as functions of the numbers of projectile collisions ν_p and secondary collisions ν_s in the nucleus, and indicate that rescattering contributes significantly to enhancement of Λ production but not to K^0 production. The properties of events with multiple K^0's or Λ's also corroborate this conclusion. K^0 rapidities are in the central region and decrease gently with increasing ν_p, while Λ rapidities are in the target-fragmentation region and are independent of ν_p. K^0 and Λ multiplicities increase with the rapidity loss of the projectile, but their rapidities do not. [Phys. Rev. D **45**, 734 (1992)]

Determination of pion intranuclear rescattering rates in ν_μ-Ne versus ν_μ-D interactions for the atmospheric ν flux. R. Merenyi,* W. A. Mann, T. Kafka, W. Leeson, B. Saitta,† and J. Schneps, *Tufts University, Medford, Massachusetts 02155;* M. Derrick and B. Musgrave, *Argonne National Laboratory, Argonne, Illinois 60439.* (Received 4 April 1991; revised manuscript received 23 October 1991)

Intranuclear rescattering rates are determined for low energy pions created within neon nuclei by muon neutrinos with energies between 0.4 and 6.0 GeV. Specifically, charged current ν_μ-neon and ν_μ-deuteron interactions from two accelerator bubble chamber experiments are E_ν weighted to match the shape of the atmospheric neutrino spectrum. The relative populations of final states within the weighted event samples imply rates for pion absorption and pion charge exchange, which expressed as probabilities per final state pion, are 0.22 ± 0.05 and 0.10 ± 0.08, respectively. Inclusive $\pi^\pm$ momenta and production angle distributions from neon are found to be similar to those from deuteron targets; sizable kinematic distortions attributable to inelastic rescattering are absent. However, the fraction of π^+ (π^-) momenta in neon which are less than 300 MeV/c and backward in the laboratory system slightly exceeds the deuteron fraction, by 0.03 ± 0.04 (0.11 ± 0.10). Our measurements indicate the extent to which pion intranuclear rescattering may distort final states resulting from atmospheric neutrino reactions or from nucleon decays in nuclei having mass number near $A=20$. [Phys. Rev. D **45**, 743 (1992)]

Quantum mechanical model of color transparency. Jean-Paul Blaizot, *Service de Physique Theorique, Centre d'Etudes Nucléaires Saclay, 91191 Gif-sur-Yvette CEDEX, France;* Raju Venugopalan and Madappa Prakash, *Physics Department, State University of New York at Stony Brook, Stony Brook, New York 11794-3800.* (Received 13 May 1991)

We study a simple quantum-mechanical model that illustrates various conceptual questions associated with color transparency. [Phys. Rev. D **45**, 814 (1992)]

