ERRATUM

DECAY OF THE ρ^0 MESON, AND THE POSSIBLE EXISTENCE OF A $T=0$ SCALAR DI-PION. Loyal Durand, III, and Yam Tsi Chiu [Phys. Rev. Letters 14, 329 (1965)].

Because of a minor programming error, the effect of the ρ^0–ϵ^0 interference on the di-pion decay distribution in the reaction $\pi^- + p \to \pi^+ + \pi^- + n$ was underestimated in the calculations reported in this note. Since the magnitude of the interference term is proportional to $\Gamma_\epsilon^{1/2}$ after integration over di-pion masses in the ρ^0, ϵ^0 region, the previous calculations favored large values of the ϵ^0 decay width. We now obtain somewhat better fits to the 3- and 4-BeV/c data than those reported, using a value 730 MeV for the mass of the ϵ^0,[1] and a total decay width $\Gamma_\epsilon = 90$ MeV. A somewhat smaller width would probably also be satisfactory if a small $T=2$ S-wave term, and $T=0$ or 2 D-wave terms, were included in the background. The reduction in Γ_ϵ from 140 to 90 MeV reduces the ϵ^0 production cross section from roughly 15 to 10% of the ρ^0 cross section, the ϵ^0 decaying two-thirds of the time in the $\pi^+\pi^-$ mode and one-third of the time in the $\pi^0\pi^0$ mode.

It is, of course, tempting to associate the ϵ^0 with the 725-MeV $K\pi$ resonance κ in a unitary octet of scalar mesons. Unless the mass of the physical ϵ^0 has been shifted to a higher value by mixing with a lower mass unitary singlet, the $T=1, J^{PG}=0^{+-}$ members of the octet (π') would lie near 700 MeV, very close to the threshold for the strong decay $\pi' \to \eta + \pi$. However, the π' may be produced only weakly in πN collisions: It is not possible to produce this particle by vector-meson exchange, and for the accepted value $\frac{3}{2}$ of the D/F ratio for pseudoscalar meson-baryon coupling, $g_{\eta NN}{}^2 \approx 0$. It may therefore be difficult to observe the π' directly through its decay products.

[1]Private communications from W. Selove and T. Ferbel.