is quite small[8], although it may be of theoretical interest in the analysis of the performance of electronic instruments.

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On the Problem of K^0 Decays

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If we assume that in K-meson decays parity is conserved, then from the whole of the experimental data it apparently follows that there exist two mesons τ and θ with spin and parity 0^- and 0^+ respectively. Then it must be supposed that there exists a certain "degeneracy in parity" for the "strange particles"[1]. On the other hand one can assume that there exists only one K meson and that parity is not conserved in the decay interactions[2]. In the present note we point out one possibility for an experimental test of the hypothesis of nonconservation of parity.

We suppose that parity is conserved and consider the decay of a τ^0 meson. The possible decay schemes for it will be

$$\tau^0 \begin{array}{l}\nearrow \pi^+ + \pi^- + \pi^0 \\ \searrow 3\pi^0\end{array}, \qquad \tau^0 \to \begin{array}{c}\mu^\pm \\ e^\pm\end{array} + \nu + \pi^\mp .$$

Like the θ^0 meson, the τ^0 meson must represent a mixture of charge-even and charge-odd components

$$\tau^0 = \left(\tau_s^0 + i\tau_a^0\right) / \sqrt{2} .$$

τ_s^0 will decay according to all four possible schemes, with the decay $\tau_s^0 \to 3\pi$ being the isotopic analogue of the τ^+ decay.

For τ_a^0 the decay $\tau^0 \to 3\pi^0$ is forbidden, and the decay $\tau^0 \to \pi^+ + \pi^- + \pi^0$ must go into states with orbital angular momentum different from zero and will be suppressed, so that the main decay for it will be

$$\tau_a^0 \to \begin{array}{c}\mu^\pm \\ e^\pm\end{array} + \nu + \pi^\mp .$$

For both components the lifetime will be of the order of 10^{-7} sec.[3]

The situation is fundamentally changed if we assume that there exists one K meson but that decays occur with nonconservation of parity. In this case the main decay for the K_s^0 component will be $K^0 \to \pi^+ + \pi^-$; this decay is a fast one, so that the lifetime of K_s^0 will be $t \sim 10^{-10}$ sec. The charge-odd component, for which two-meson decay is impossible[4], will decay mainly according to the schemes

$$K^0 \to \begin{array}{c}\mu^\pm \\ e^\pm\end{array} + \nu + \pi^\mp \quad \text{or} \quad K^0 \to 2\pi + \gamma$$

with lifetime $t \sim 10^{-8}$-10^{-7} sec.

Let us consider the decay curve of $\tau^0 \to \pi^+ + \pi^- + \pi^0$. In the case of conservation of parity, we must observe two slightly separated exponentials with nearly equal lifetimes $t \sim 10^{-7}$ sec. But in the case of nonconservation of parity we must observe together with an exponential of lifetime $t \sim 10^{-8}$-10^{-7} sec a short-lived component with lifetime of the order of 10^{-10} sec.

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