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A POSSIBLE EVENT OF CHARMED PARTICLE DECAY VIA THE (WEAK) NEUTRAL CURRENT ACCORDING TO A SCHEME

$$M_c \rightarrow e^+ e^- + \text{HADRONS}$$

M.M.Chernyavsky, A.A.Komar, G.I.Orlova, M.I.Tretyakova

P.N.Lebedev Physical Institute of the Academy of Sciences
of the USSR, Moscow

Abstract   (This is only the abstract.)

In a stack of nuclear emulsion irradiated by 200 Gev/c π^- - mesons at FNAL, we have made a search for new short-lived particles by tracing all secondary tracks from the star in a cone of $\theta < 0,1$ rad up to the distance of 1 mm. The sample of stars consisted of 350 π^- N- and 250 π^- A-interactions.

We have found one peculiar event. Among π^- A-interactions there is star of type 21+6+23p in which one secondary prong ($\theta_L = 4,6°$) gives at the distance 42μ from the center of the star very narrow jet of the type 0+0+5p. Measurements of the angles, momenta and ionisations of the particles from this jet allowed to identify two particles as electrons. A total momentum of all five particles is about 9 Gev/c.

Probability to observe such narrow jet due to an ordinary nuclear interaction on nucleon or coherent reaction on nucleus

with production of five charged particles (including e^+e^- pair) at 10-20 Gev/c is less than $0.5 \cdot 10^{-6}$, and by this reason we treat it as a decay of new short-lived particle. Estimation of the mass of this particle is in agreement with the value expected for the charmed particle. Its life time is $\sim (2-3) \cdot 10^{-14}$ sec.

Two electrons appearing in the decay of this particle allow one to interpret it as a possible example of the charmed particle decay due to (weak) neutral currents according to the scheme $M_c \rightarrow e^+e^- +$ hadrons.