where ε_F is the Fermi energy and R is the characteristic dimension of the body.

In conclusion I am grateful to L. N. Bulaevskii and V. M. Fain for valuable discussions.

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VERIFICATION OF THE CONSEQUENCES OF THE $\Delta T = 1/2$ RULE IN THE $K \to 3\pi$ DECAY

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In [1] they obtained a relation for the total probabilities of the τ decay from the $\Delta T = 1/2$ rule. However, a verification of this relation is made difficult by the fact that it contains the pion scattering lengths a_T, which are not well known at present.

It is noted in [2] that the influence of scattering, leading to singularities on the boundary of the physical region of the decay, can be decreased by comparing the total probabilities near the center of the Dalitz plot. We present below a relation for γ_R - the total probabilities in a circle of radius R with center at the center of the Dalitz plot, divided by the area of the circle:

$$\frac{\gamma_R^{++-}}{4\gamma_R^{oo+}} - \frac{3\gamma_R^{+-o}}{2\gamma_R^{ooo}} = -\frac{175}{54}\Phi(R)(a_2 - a_o)^2 m_\pi E \,. \tag{1}$$

$R = 3Q/E$ and varies from 0 to 1; $E = M_k - 3m_\pi$; Q - maximal pion energy on the boundary of the circle, measured from the center of the Dalitz plot. At small values of R we have $\Phi(R) \simeq 3/64R^2$ and

$$\frac{\gamma_R^{++-}}{4\gamma_R^{oo+}} - \frac{3\gamma_R^{+-o}}{2\gamma_R^{ooo}} = -\frac{175}{128}(a_2 - a_o)^2 m_\pi (Q^2/E). \tag{2}$$

When R = 1 we have $\Phi(1) = 1/3 - \sqrt{3}/2$ and the result agrees with the relation obtained in [1]:

$$\frac{\gamma^{++-}}{4\gamma^{oo+}} - \frac{3\gamma^{+-o}}{2\gamma^{ooo}} = -\frac{175}{162}\left(1 - \frac{3\sqrt{3}}{2\pi}\right)(a_2 - a_o)^2 m_\pi E \,. \tag{3}$$

The table lists the values of $\Phi(R)$.

Relation (1) is valid under the following assumptions:

a) the decay is due to an interaction with $\Delta T = 1/2$ and $\Delta T = 3/2$;

b) transitions with $\Delta T = 5/2$ are small compared with $\Delta T = 1/2$, so that we can confine ourselves to the first order in this interaction;

c) there are no transitions with $\Delta T = 7/2$;

R	Φ(R)	R	Φ(R)
0	0.001	0.6	0.020
0.1	0.002	0.7	0.026
0.2	0.003	0.8	0.035
0.3	0.005	0.9	0.045
0.4	0.010	1	0.058
0.5	0.013		

d) in the analytic terms of the decay amplitude it is possible to confine oneself to the terms linear in the energies and in the masses;

e) non-analytic (singular) terms arise only as a result of the diagrams shown in Figs. 1 and 2; this is valid of the scattering lengths are not large at low energies $a_T \lesssim 1/m_\pi$;

f) the pion mass differences can be regarded in the non-analytic terms.

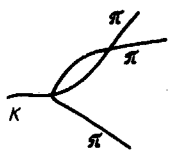

Fig. 1

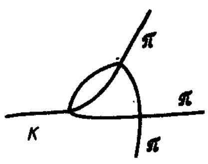

Fig. 2.

We note that the contribution of the diagrams (Fig.2) can be neglected for the following reasons: the contribution of these diagrams to the part of the amplitude corresponding to the symmetrical Young pattern is the same for all decays and therefore cancels out, and the interference of the symmetrical and asymmetrical Young patterns vanishes upon integration over the circle, while the square of the asymmetrical Young pattern is of the order of $m_\pi^2 E^2 a^4 < E^2/m_\pi^2$ and should be discarded.

It is seen from the table for $\Phi(R)$ that for the circle R = 1/3 the right-hand side of (1) does not exceed 1%, making it possible to check the assumption at the level of about one per cent.

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PHOTOCONDUCTIVITY OF SEMICONDUCTORS AT LARGE LIGHT INTENSITY

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1. It is known that the absorption coefficient of semiconductors decreases with increasing light intensity. According to Krokhin [1], the saturation effect consists of an equalization of the electron populations in the valence and conduction bands, so that the difference of the Fermi quasilevels of the electrons and holes becomes equal to the frequency of the light

$$\mu_n - \mu_p \simeq \omega, \quad \hbar = 1. \tag{1}$$

Obviously, the concentration of the photoelectrons (holes) tends to the constant limit n.

2. We show in this paper that the photocurrent produced under the influence of an external electric field decreases with increasing light intensity at high intensities. The physical reason for this effect is that the anisotropy of the electron momentum distribution, appearing under the influence of the field E, leads to anisotropy of the absorption. The electrons are now produced predominantly with a momentum opposite that obtained from the field, since the absorption coefficient for such momenta becomes larger.