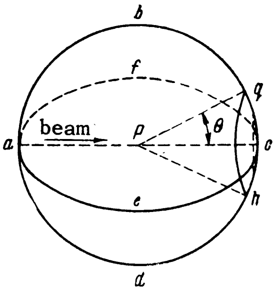
sion probabilities of secondary particles within the angles Ω_1 and Ω_2, by $\bar{n}$ the mean number of particles in stars, and by D_n the dispersion of the number of particles. If we assume that the directions of emission of secondary particles are statistically independent, we obtain for the correlation coefficient $R = (\overline{n_1 n_2} - \overline{n_1}\overline{n_2})$ the relation $R = p_1 p_2 (D_n - \bar{n})$.

450 stars, found in scanning of an emulsion chamber consisting of layers of the NIKFI-R emulsion 400 μ thick, were used for the determination of R. The chamber was irradiated by the internal proton beam of the Joint Institute for Nuclear Research synchrophasotron. Scanning was carried out along the tracks produced by primary protons.

The measured values of D_n and $\bar{n}$ were found to be 3.64 ± 0.15 and 3.23 ± 0.09 respectively. The value of $Q = R - p_1 p_2 (D_n - n)$ was then measured for different angles Ω_1 and Ω_2.* The results are given below. The choice of the angles Ω_1 and Ω_2 is illustrated in the figure.



P – point of interaction; afcea – emulsion plane; I – angle between the planes afcPa and abcPa, II – angle between the planes abcPa and aPcea, III – angle between the planes aPcea and aPcfa, IV – angle between the planes aPcda and aPcfa, V – solid angle qPh (θ = 27°), VI – solid angle (4π – qPh).

Ω_1	I + II or I + III	I + IV	V
Ω_2	III + IV or II + IV	II + III	VI
p_1	0.5	0.5	0.5
p_2	0.5	0.5	0.5
Q	0.10±0.03	−0.02±0.06	−0.17±0.06

The results indicate that the directions of emission of secondary particles are not entirely independent statistically.

In addition, we studied the problem of narrow particle pairs, the presence of which would indicate either the existence of intermediate rapidly-decaying particles[2] or a strong attraction between some secondary particles.[3] We selected particles pairs in stars with a difference in the angle of emission less than $\Delta = 3.5 \times 10^{-2}$. Six such pairs were observed in the analysis of 375 splittings, not counting, naturally, pairs due to π^0 decay according to the scheme $\pi^0 \rightarrow e^+ + e^- + \gamma$. The number of chance pairs, calculated under the assumption of statistical independence of the directions of emission of secondary particles, was found to be 5.9, which is in a good agreement with the observed value.

The study of correlations of the emission angles of secondary particles may prove useful as a check of the statistical theory of multiple-particle production.[4]

For this purpose it would be advantageous to investigate elementary collisions of nucleons and π mesons with nucleons. It is also necessary to account for possible angular correlations connected with conservation laws.

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*The dispersion D_m of the number of particles m in different fixed solid angles Ω was determined at the same time. It was found that in all cases $D_m \approx m$, i.e., $\alpha = D_m/\bar{m} \approx 1$. This result may be used in determination of the interaction energy from the angular distribution of secondary particles (cf., e.g., reference 1).

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TRANSITION EFFECT FOR ELECTRONS IN WALLS OF AN IONIZATION CHAMBER

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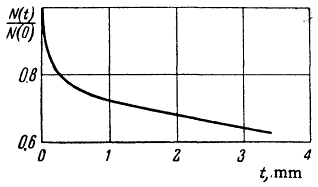
IONIZATION chambers have been used recently in a number of experiments[1] on the determination of the energy of nuclear active particles. A lead absorber is placed directly above the chamber, in which the electron-photon cascade, initiated by π^0 mesons produced in nuclear interactions, develops.

The energy carried away by π^0 mesons is determined from the number of electrons in the chamber. The transition effect in the chamber walls changes the picture. The transition effect, however, has not been accounted for in any of the experiments, although the thickness of the walls vary considerably.

We calculated the change of the number of electrons in the transition of the cascade from lead into the iron wall of the chamber. The calculations were carried out according to formulae given in Ch. VI of the book of Belenkii.[2] The calculations given there, however, do not take into account the scattering of low energy electrons which influences considerably the effective range of such electrons. We accounted for the variation of the range of low energy electrons due to their scattering according to Chap. VII, § 27 of the book. An equilibrium electron spectrum and a photon spectrum accounting for the energy dependence of the total photon absorption coefficient were used. The calculation is applicable to a thickness of lead equal to or greater than t_{max} since the electron spectrum in lead at cascade maximum is close to equilibrium and slowly varies with depth[3] (t_{max} is the depth of cascade maximum). The result of the calculation for the transition effect lead-iron is shown in the figure. The sharp decrease in the number of electrons for a small thickness of iron is due to ionization stopping of electrons and can be explained by the soft energy spectrum in lead. The difference in the transition effect due to variation of the chamber wall thickness from 1 to 3 mm amounts to 8% only.



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ANISOTROPY OF THE ELECTRICAL RESISTANCE OF A GOLD MONOCRYSTAL IN A MAGNETIC FIELD AT 4.2°K

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THE results of numerous experiments (cf., for example, references 1 and 2) concerned with the investigation of the galvanomagnetic properties of monovalent metals are in disagreement with theory. In view of this, it appeared of interest to investigate the character of the electrical resistance of these metals in a magnetic field for various crystalline orientations.

A gold monocrystal is most suitable for this purpose. The monocrystal was prepared from gold of 99.9999% purity. It was in the form of a cylinder 30 mm in height and 0.3 mm in diameter. The resistance of the sample varied by a factor of 1650 between room temperature and 4.2°K. The fourth-order axis of the crystal was oriented approximately along the axis of the sample. To avoid the secondary effects commonly observed with sufficiently pure metals in a magnetic field, the gold crystal was mounted with the results of reference 3 taken into consideration.

A polar diagram was taken for this crystal at 4.2°K, in a magnetic field H = 23 kilooersteds, which was rotated in a plane perpendicular to the axis of the sample.

The dependence of $\Delta r_H / r_0 = (r_H - r_0)/r_0$ (where r_H and r_0 are the resistances in the presence and the absence of the magnetic field) upon the magnetic field was determined for the directions of the greatest of the maxima and the smallest of the minima of the polar diagram. The results of these measurements are illustrated in Figs. 1 and 2 (the region represented in Fig. 2 is indicated by the rectangle in Fig. 1). The mag-