detector.[3] This makes it possible to use the results on lateral distribution obtained in Ref. 3:

$$\rho_p = (0.66 \pm 0.09) \exp[-(0.00058 \pm 0.00009) r^2]. \tag{3}$$

In consequence, a density of $(0.42 \pm 0.06)\ m^{-2}$ is found for the effective distance of 28 m.

The results for all three depths are then found to be consistent. These data, expressed in energy units which account for the atmospheric depth and refer to approximately equal effective distances, are given in Table II.

TABLE II

Depth (Bev)	Effective Distance (m)	Density of Penetrating Particles (m^{-2})
14.9	28	0.42 ± 0.06
29.5	27	0.20 ± 0.02
37.1	29	0.15 ± 0.02

The energy spectrum of penetrating particles of an extensive air shower calculated from the above data for a mean distance of 28 m from the shower axis can be represented by a power law $\rho_p = AE^{-\gamma}$ with $\gamma = 1.09 \pm 0.21$.

In conclusion it should be noted that a tendency has been observed of a variation of the spectrum exponent with decreasing energy of the shower. Further experiments are being carried out to investigate this effect and to improve the degree of knowledge of the shape of the spectrum.

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TRANSITION EFFECT OF STARS IN A LEAD ABSORBER

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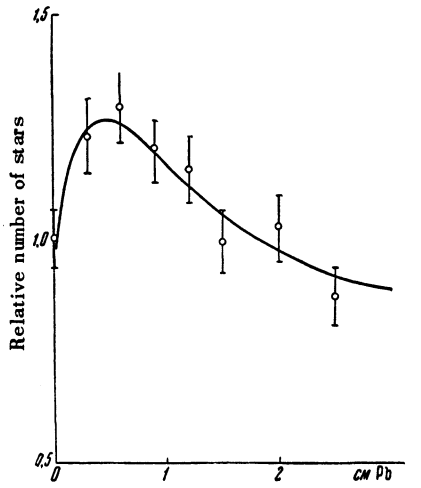
EXPERIMENTS carried out at mountain altitudes[1-3] and in the stratosphere[4,5] have established the existence of a transition effect of stars by means of photographic emulsions. However, such effect was found in other similar experiments.[6,7] Interest in this phenomenon was increased after a transition effect for stars was also found in a graphite absorber,[8] and in this way it was shown that the explanation of the transition effect in lead by means of the photon component of cosmic rays was not tenable.

In this note we present results of a control experiment undertaken in order to observe by means of photographic emulsions the transition effect for stars in lead absorbers.

Flat lead absorbers were placed one above another. Each layer of lead had an area of $40 \times 60\ cm^2$. The photographic films were placed horizontally singly at each depth of the lead absorber. The exposure was carried out at an altitude of 3100 m above sea level. The figure shows the results of the experiment. As may be seen from the graph the maximum of the transition effect amounts to 30%.

Since the transition effect is not found by all observers, it should be noted that at mountain altitudes its magnitude is not great (according to the data of various authors it amounts to 15 — 30%); at the same time the average efficiency of a scanner is 80%, therefore the results are strongly affected by the method and the quality of scanning. Thus, for example, as a result of carrying out a single scanning the existence of the maximum in the curve is not very pronounced. We have employed three fold scanning of the same volume of photographic emulsion in which three different scanners took part. This has greatly increased the efficiency of scanning and has lead to the discovery of a sharply pronounced maximum. The small depth at which the maximum in the transition effect of stars occurs may also explain the absence of a transition effect under unfavorable experimental conditions — unfavorable absorber geometry, thick stacks of photographic emulsion, nearby massive objects, etc.



The results obtained by us do not disagree with the results of other investigators.

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ELECTROMAGNETIC INTERACTION WITH PARITY VIOLATION

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UNTIL the discovery of violation of parity it was assumed that the interaction of an elementary particle of spin $\frac{1}{2}$ with a weak electromagnetic field was completely described by three terms in the energy

$$q\varphi, \ \mu(\sigma \mathbf{H}), \ a \operatorname{div} \mathbf{E} = 4\pi a\rho,$$

where σ is the spin, q the charge, μ the magnetic moment and the constant a characterizes the field of a spherical capacitor, equal to zero outside but interacting with a charge ρ inside.[1]

In their well known article about nonconversation of parity, Lee and Yang[2] indicate the possibility of an electrical dipole moment, i.e., an interaction $d(\boldsymbol{\sigma} \cdot \mathbf{E})$. However, if, with parity violation, there is conservation of invariance with respect to combined inversion (and consequently, also with respect to reflection in time) then, as Landau[3] has shown, no dipole moment is possible. It is easiest to see this by noting that under time inversion σ changes sign but **E** does not.