ing dependence of ρ on the angle has both a variable amplitude (which increases noticeably in the region of the angles α, β, and γ) and a variable period, which decreases with increasing distance from the minimum. Figure 2 shows the dependence of the resistance on the field at the minimum of the angle diagram. It is seen from the figure that in strong field there are produced oscillations with an amplitude that increases with the field and amounts to approximately 30% of the total magnetoresistance of the sample in a field close to 65 kOe. The general behavior of the function $\rho(H)$ agrees sufficiently well with the results of [1]; thus, for example, the magnetic field at which the slope of $\rho(H)$ changes is equal approximately to 48 kOe.

The period of the observed oscillations does not depend on the reciprocal of the magnetic field. The period of the oscillations at the minimum is 1.1×10^{-7} Oe^{-1}. The amplitude of the oscillations increases more than 10 times when the sample is rotated 4° relative to the direction of the magnetic field corresponding to the minimum of $\rho(\phi)$. In the angle regions close to α, β, and γ (see Fig. 1) the amplitude of the oscillation again increases and amounts to approximately one-third the amplitude of the oscillations at the minimum. The period of the oscillations decreases in this case and takes on values 0.9×10^{-7}, 0.77×10^{-7}, and 0.64×10^{-7} for the angles α, β, and γ respectively. Such a value of the period can correspond, according to the data of [2], to the sections of the "monster."

This communication should be regarded as preliminary. The results will be described in greater detail in a special article.

In conclusion, the authors consider it their pleasant duty to thank Academician P. L. Kapitza for interest in the work.

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*The Hall pickup was an InSb crystal with increased electron density, graciously furnished by I. Hlasnik [4]. While such a pickup has a slightly lower sensitivity, it has very good linearity (not worse than 1%) up to fields of 100 kOe.

MEASUREMENT OF DIFFUSE X-RAY BACKGROUND OF OUTER SPACE IN THE ENERGY REGION 1 - 1.5 keV

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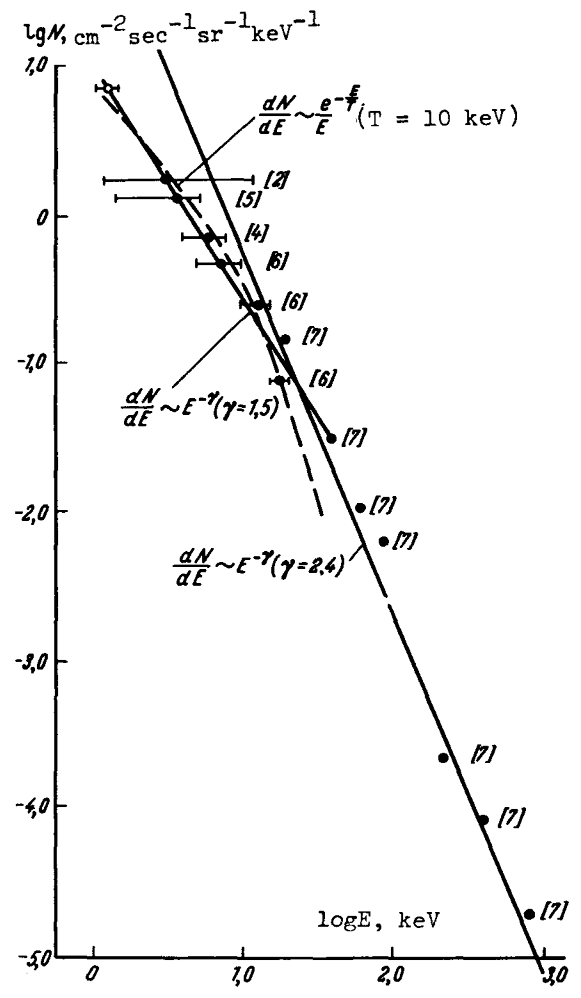
A number of investigators have recently observed, with the aid of apparatus installed on rockets and high-altitude balloons, a diffuse x-ray background from outer space [1-7].

The nature of this radiation has not yet been established. In particular, recognizing that the measurements were made at relatively low altitudes, there is no assurance that it originates in outer space and not near the earth, say as a result of deceleration of fast electrons in the upper layers of the atmosphere. The available data pertain to energies of several keV and higher. Thus, in [2] the center of the spectral sensitivty of the radiation receivers (photon counters) was near 3 keV, in [4] the measurements were made in the 4 - 8 keV region, in [6] in the 5 - 20 keV region, and in [7] in the 20 keV - 1 MeV range.

To ascertain the nature of the diffuse x-ray backtround, it is most important to perform measurements outside the earth's atmosphere and in as soft a spectral region as possible. We performed the measurements in the 1 - 1.5 keV region with the aid of the same apparatus borne by the lunar satellite "Luna-12" as used to observe the x-ray fluorescence of the moon's surface layers [8].

The radiation receiver was a Geiger photon counter with an aluminum window 10 μ thick and area 3 cm^2, filled with an Ne-Xe mixture; the field of view was approximately one steradian. The counter spectral sensitivity regions were 8 - 14 Å with approximate efficiency 30% at the maximum, and 2 - 6 Å with efficiency close to 3% at the maximum. The readings of this counter, when pointed to outer space past the moon, were compared with the readings of a similar control counter, covered in addition with an Au-Ag filter and made insensitive to the soft x-radiation, but having the same sensitivity to the cosmic-ray and electron background.



Spectral distribution of number of photons in diffuse x-ray background from outer space, as obtained in a number of investigations. Upper point - present work.

The contribution made to the counting rate by the emission from outer space, averaged over all measurements, was about 1 count/cm^2-sec-sr;* corresponding to the 8 - 12 Å (1.5 - 1 keV) are approximately 7.5 photons/cm^2sec-sr-kV.

Our results are compared in the figure with those measured in the cited references; the horizontal bars denote the spectral sensitivity region of the employed radiation receiver, and the circles the centers of the spectral sensitivity regions. The figure shows also the photon-number distribution corresponding to the power law $dN/dE \sim (h\nu)^{-\gamma}$ with $\gamma = 2.4$ [7] and $\gamma = 1.5$, as well as the distribution corresponding to thermal emission from a transparent plasma layer, $dN/dE \sim (1/h\nu)\exp[-h\nu/kT]$ with kT = 10 keV [6].

An examination of the figure shows that in the region of high photon energies, $h\nu \geq 20$ keV, all measurements agree well with a power law with $\gamma = 2.4$. At low energies, $h\nu \leq 10$ to 20 keV, the deviation from this law, which was noted in earlier investigations, is now seen quite reliably - the measurements correspond either to a power law with $\gamma \approx 1.5$, or to an exponential law with $kT \approx 10$ keV. The measurement accuracy is as yet insufficient to give preference to either, and it is necessary to move to the region of lower energies, where the absorption in the galaxy already comes into play.

Thus, the figure shows that there are possibly two mechanisms participating in the generation of x-radiation in outer space. A more detailed report on the results and a possible interpretation will be given later [9].

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*When radiation with $h\nu = 1 - 1.5$ keV is generated in intergalactic space, it passes through our galaxy practically without being attenuated in any direction; this justifies our averaging all our measurements.

LASER SPARK IN A STRONG MAGNETIC FIELD

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Investigations of a laser spark in a strong magnetic field are of undisputed interest. The energy-release density in the case of optical breakdown in the focus of a laser is about 2×10^{11} erg/cm^3 [1,2], corresponding in energy density and in pressure to a magnetic field on the order of 2×10^6 G. Since our equipment made it possible to obtain magnetic fields up to 3×10^5 G, we expected the magnetic field to exert an influence on the spark development for those breakdown stages in which the energy density in the plasma was not too high. During the breakdown, however, an appreciable fraction of the energy goes to the production of a shock wave, and only a small fraction is transformed into radiation [3]. Therefore, if the magnetic field has even a slight influence on the energy carried away by the shock wave, this can lead to a considerable change in the emission from the spark.

We have investigated the integral radiation of a laser spark, and also the intensity of laser emission passing through the spark and the threshold of spark production.

The radiation source was a laser Q-switched by a rotating prism. The pulse duration was 20 nsec at an approximate energy of 1 J; the wavelength was $1.06\ \mu$.

The pulsed solenoid constructed by us had a large aperture, allowing the spark to be viewed at an angle up to 45° to the solenoid axis. The solenoid cavity was vacuum-insulated,