L 15710-63 EPR/EPA(b)/EWT(1)/EPF(n)-2/EWG(k)/BDS/T-2/EEC(b)-2/ES(w)-2

AFFTC/ASD/ESD-3/AFWL/IJP(C)/SSD Pa-4/Pd-4/Pu-4/Pz-4/Pi-4/Pab-4/Po-4 WW/AT

ACCESSION NR: AR3002549 S/0124/63/000/005/B005/B005

100
99

SOURCE: Rzh. Mekhanika, Abs. 5B21

AUTHOR: Dorman, L.I.

TITLE: Magnetic field perturbations during wave and jet motion in a conducting medium

CITED SOURCE: Sb. Vopr. magnitn. gidrodinamiki i dinamiki plazmy. v. 2. Riga, AN LatvSSR, 1962, 63-70

TOPIC TAGS: perturbation, magnetic field, jet, wave, conducting medium, gravitational wave, viscous liquid, Hartman number

TRANSLATION: Solutions are given for three cases of perturbation of the magnetic field for small magnetic Reynolds numbers and small Hartman numbers. The equation for the determination of the magnetic field thereby becomes linear; the velocity vector which enters into it is found in advance from the hydrodynamic equations, in which the magnetic terms are neglected. The liquid is assumed to be incompressible.

Card 1/2

L 15710-63
ACCESSION NR: AR3002649

The perturbation of the magnetic field upon the propagation of the gravitational waves on the surface of the conducting liquid, which occurs in a homogenous magnetic field is found. During the solution of the hydrodynamic problem it is assumed that the amplitude of the wave is much less than its length, which allows the linearizing of the problem. As an example, the perturbation of the field for liquid sodium and sea water in the earth's magnetic field is calculated.

The perturbation of the magnetic field for a rectilinear submerged jet with exponential velocity distribution and for a rectilinear flow of a viscous conducting liquid in a tube is calculated. M.D. Ladyzhenskiy

DATE ACQ: 14Jun63 SUB CODE: PH ENCL: 00

Card 2/2

L 15724-63 EWT(1)/BDS AFFTC/ESD-3 Pi-4/Po-4 TF
ACCESSION NR: AR3002663 S/0124/63/000/005/B014/B015

SOURCE: Rzh. Mekhanika, Abs. 5B69

64

AUTHOR: Volkov, Yu.M.; Dorman, L. I.; Mikhaylov, Yu. M.

TITLE: Experiments on generation of a magnetic field in metals and the question of the origin of the geomagnetic field

CITED SOURCE: Sb. Vopr. magnitn. gidrodinamiki i dinamiki plazmy. v. 2. Riga, AN LatvSSR, 1962, 155-169

TOPIC TAGS: metal, sphere, rotation, geomagnetic field, earth, copper, lead, brass layer, magnetohydrodynamics, induced field

TRANSLATION: Experiments on the generation of a magnetic field during the rotation of a conducting body in an external magnetic field are described. Previously, theoretical formulas for the induced field were introduced. The rotation of a metallic sphere with constant angular velocity in an external homogeneous magnetic field is considered. Expressions are obtained for the induced azimuthal field in two cases: when the sphere is surrounded by a stationary conducting,

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L 15724-63
ACCESSION NR: AR3002663 0

solid medium, and when the sphere is submerged in a viscous conducting liquid, which is also rotating.

The induced field is proportional to the external field, and the angular frequency of the rotation also depends on the ratios of the conductivities of the body and the medium. In the case of a solid medium the induced field falls with distance from the center of the sphere as $1/r^3$, and in the case of the liquid medium, as $1/r$. The obtained dependence is verified by experiment. The experiment was conducted not with a sphere, but with a rotating cylinder. At a large distance from the cylinder, the field in the first approximation ought to be the same for the spherical rotator, as for the cylindrical, limited in respect to height. The rotation of a copper rotator was studied, set in lead, copper, brass, and mercury layers, and also the rotation of a mercury rotator in copper. The rotations of solid metallic rotators in mercury were studied. The experiment verified the entire theoretical dependence. Induced field magnitudes of up to 1/30 of the external field were obtained.

The obtained results give a basis for judgment of the origin of geomagnetic field. They support the validity of the hypothesis of the magnetohydrodynamic derivation of the earth's field. Yu.R.

DATE ACQ: 14Jun63 SUB CODE: PH, ML ENCL: 00
Card 2/2

L 15723-63 EWT(1)/HDS/EEC-2/ES(v) AFFTC/ASD/AFMDC/ESD-3/APGC
Pe-4/P1-4/Po-4/Pq-4 GW
ACCESSION NR: AR3002662 S/0124/63/000/005/B014/B014

76

SOURCE: Rzh. Mekhanika, Abs. 5B68

AUTHOR: Dorman, L.I.

TITLE: Turbulence characteristics in the solar wind[12]

CITED SOURCE: Sb. Vopr. magnitn. gidrodinamiki i dinamiki plazmy. v. 2. Riga, AN LatvSSR, 1962, 187-189

TOPIC TAGS: solar wind, cosmic ray, turbulence, fluctuation, magnetic field

TRANSLATION: The assumption is made that the fluctuation of the magnetic field in the solar wind has a complete spectrum ranging from $l_{min} \approx 10^{11}$ to $l_{max} \approx 10^{13}$ cm. Then the diffusion coefficient of the cosmic rays is proportional to the particle energy if their radius of curvature $\sim l_{max}$ and proportional to the square of the energy for particles with large radii of curvature trajectories, which enables one to explain the observed variation in the cosmic rays in all energy ranges. S.A. Kaplan

DATE ACQ: 14Jun63 SUB CODE: PH ENCL: 00

Card 1/1

L 15722-63 EWT(1)/EWG(k)/FCC(w)/BDS/EEC-2/ES(v)/ES(w)-2 AFFTC/AFMDC/
APGC/ASD/ESD-3/SSD Pz-4/Pe-4/Pab-4/Pi-4/Po-4/Pq-4 AT/GW

ACCESSION NR: AR3002661 S/0124/63/000/005/B014/B014

92

SOURCE: Rzh. Mekhanika, Abs. 5B67

AUTHOR: Dorman, L.I.

TITLE: Properties of magnetic traps in plasmas ejected from the sun

CITED SOURCE: Sb. Vopr. magnitn. gidrodinamiki i dinamiki plazmy. v. 2. Riga, AN LatvSSR, 1962, 279-284

TOPIC TAGS: plasma, trap, magnetic trap, solar plasma, sun, particle, Fermi mechanism

TRANSLATION: A survey is made of studies and calculations, verifying the formation, in plasma currents which are ejected from the sun of magnetic traps with field intensity from 10^{-5} to 10^{-4} oe, formed when, at the leading edge of the current, the field is increased 3-6 times. The energy of the trapped particles is less than the energy of the field; the lower boundary of their spectra is 3-5 mega ev. The spectra were tracked to 30-40 mega ev. The particles are accelerated in the trap by the first order Fermi mechanism. The traps are formed at distances of one and a half to two radii from the center of the sun.

Card 1/2/

S/203/62/002/003/005/021
I023/I250

AUTHOR: Dorman, L.I. and Inozemtseva, O.I.

TITLE: The nature of a local source of diurnal anisotropy of cosmic rays during the main phase of a magnetic storm

PERIODICAL: Geomagnetizm i Aeronomiya, v.2, no.3, 1962, 453-463

TEXT: The article presents an investigation of the anomalous diurnal variation during the main phase of the magnetic storm of February 11, 1958, based on data obtained by means of the crossed telescopes of the Capetown station and the neutron monitors world network. It is shown that in this case, apart from a remote source of anisotropy, there is a local one. The remote source is connected with the action of the electromagnetic field of the solar wind on cosmic rays. The local source appears as a result of a direct influence of an asymmetrically distorted geomagnetic field on cosmic rays. A quantitative estimate of the effect is obtained, based on theoretical calculations given in literature. The results are compared with experimental data. There are 8 figures, 2 tables, 10 re-

Card 1/2

S/203/62/002/003/005/021
I023/I250

The nature of a local source...

ferences. The most important reference: T. Obayasi. Rept. Ionosphere Res. Japan, 1959, 13, No.3, 201.

ASSOCIATION: Magnitnaya Laboratoriya Akademii nauk SSSR, Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln Akademii nauk SSSR (Magnetic Laboratory, Academy of Sciences of the USSR; Institute of Terrestrial Magnetism, Ionosphere and Radiowave Propagation, Academy of Sciences of the USSR)

SUBMITTED: February 19, 1962

Card 2/2

4242

S/203/62/002/004/002/018
I046/I242

3,2430

AUTHORS: Dorman, L.I. and Kolomeyets, Ye.V.

TITLE: The effect of small solar flares on the neutron component of cosmic rays as a function of time and location of preceding flares

PERIODICAL: Geomagnetizm i aeronomiya, v.2, no.4, 1962, 630-634

TEXT: Small solar flares (intensity 1) occurring a few hours after high-intensity chromospheric flares in the same active regions sometimes produce an increase in the neutron-component intensity registered on earth. When the density of the particles released in the first (high-intensity) flare is sufficient to tunnel through the local magnetic trap, which forms near the chromospheric flare, the low-energy particles released by the second flare will emerge as a corpuscular stream through the tunnel that has not yet sealed off. As a result, a slight increase in the neutron-component intensity will be registered following the substantial increase due to the

Card 1/2

S/203/62/002/004/002/018
I046/I242

The effect of small solar flares...

first high-energy corpuscular stream. If not burst as a result of the first flare, the trap may burst under the cumulative effect of the particles released in the two flares, and the emerging corpuscular stream will produce a single comparatively large neutron-component increase after the second (low-intensity) flare. In some cases, the density of particles released in two flares is insufficient to burst the trap, and no neutron-component increase is observed in correlation with the flares. There are 7 figures and 1 table.

ASSOCIATION: Magnitnaya laboratoriya AN SSSR, Kazakhskiy gosudarstvennyy universitet (Magnetic Laboratory, AS USSR; Kazakh State University)

SUBMITTED: April 13, 1962

Card 2/2

S/048/62/026/006/015/020
B125/B102

AUTHOR: Dorman, L. I.

TITLE: The variations of cosmic rays and the electromagnetic conditions existing near the earth, near corpuscular currents and in interplanetary space

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 6, 1962, 799-807

TEXT: Works relating to variations of cosmic rays, published from 1957 to date, are here reviewed. Such variations provide dependable information as to electromagnetic conditions in the space surrounding the earth. There is 1 table.

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S/056/62/043/003/003/063
B125/B102

3,2310

AUTHORS: Dorman, L. I., and Mikhaylov, Yu. M.

TITLE: Investigation of electromagnetic phenomena involved in the motion of bodies in a conducting fluid subject to a magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 3(9), 1962, 752-762

TEXT: The field distributions in fluids are determined theoretically, also allowing for the viscosity, and a check experiment is described. The motion of a sphere of radius a and with conductivity σ_1, acted on by a homogeneous magnetic field H_0 in a poorly conducting incompressible fluid with conductivity σ_2, is described by

$$\text{rot } h = 4\pi c^{-1} j, \quad \text{rot } E = 0, \tag{1},$$

$$\text{div } H = 0, \quad \text{div } j = 0, \tag{2}.$$

$$j = \sigma (E + c^{-1} [vH_0]).$$

Card 1/5

Investigation of electromagnetic ...

The coordinate system is bound to the sphere and absolute units are used. The Hartmann number and the magnetic Reynolds number, but not the hydrodynamic Reynolds number, are assumed small. The total magnetic field is represented as $\vec{H} = \vec{H}_0 + \vec{h}, \vec{h} \ll \vec{H}_0$; at infinity $\vec{v} = -\vec{v}_0$; $\vec{H} = \vec{H}_0$; $\vec{E}_\infty = -c^{-1}\left[\vec{v}_0 \vec{H}_0\right]$. If $\vec{H}_0 \parallel \vec{v}_0$ and $E = 0$, then

$$h_r = -R_M H_{0x} \frac{1}{10} \frac{r}{a} (3\cos^2\theta - 1), \quad r \leqslant a, \qquad (13),$$

$$h_r = R_M H_{0x} \frac{3}{2} \left(\frac{a^4}{10r^4} - \frac{a^2}{6r^2}\right) (3\cos^2\theta - 1), \quad r \geqslant a;$$

$$h_\theta = R_M H_{0x} \frac{3}{20} \frac{r}{a} \sin 2\theta, \quad r \leqslant a, \qquad (14)$$

$$h_\theta = R_M H_{0x} \frac{3}{20} \frac{a^4}{r^4} \sin 2\theta, \quad r \geqslant a.$$

hold for the distribution of $\vec{H}$. For $\vec{H}_0 \perp \vec{v}_0$, with $r \leq a$, $E_x = E_z = 0$ and with $r \geqslant a$

Card 2/6

$$E_x = -\frac{v_0}{c} H_{0z} \frac{3}{2} a^3 \frac{xy}{r^5} \frac{2\sigma_1 + \sigma_2}{\sigma_1 + 2\sigma_2},$$
$$E_y = -\frac{v_0}{c} H_{0z} \left[1 - \frac{a^3}{2r^3}\left(1 - \frac{3y^2}{r^2}\right) \frac{2\sigma_1 + \sigma_2}{\sigma_1 + 2\sigma_2}\right],$$
$$E_z = -\frac{v_0}{c} H_{0z} \frac{3}{2} a^3 \frac{2\sigma_1 + \sigma_2}{\sigma_1 + 2\sigma_2} \frac{yz}{r^5}, \qquad (16)$$
$$h_x = R_M H_{0z}\left(-\frac{3}{4}\frac{\sigma_1}{\sigma_1 + 2\sigma_2}\frac{a^3}{r^3} z - \frac{3}{20}\frac{a^4}{r^5} z - \frac{3}{4}\frac{a^3 x^2 z}{r^5} + \frac{3}{4}\frac{a^4 x^2 z}{r^7}\right),$$
$$h_y = R_M H_{0z}\left(-\frac{3}{4}\frac{a^3 xyz}{r^5} + \frac{3}{4}\frac{a^4 xyz}{r^7}\right),$$
$$h_z = R_M H_{0z}\left(\frac{3}{4}\frac{\sigma_1}{\sigma_1 + 2\sigma_2}\frac{a^3 x}{r^3} - \frac{3}{20}\frac{a^4 x}{r^5} - \frac{3}{4}\frac{a^3 xz^2}{r^5} + \frac{3}{4}\frac{a^4 xz^2}{r^7}\right).$$

if the velocity field has a potential. The electric field distribution in viscous fluids is described by the potential

$$\Phi = -\frac{H_0}{c}\frac{1}{r\sin\theta}\psi(r,\theta)\cos\varphi + \qquad (33).$$
$$+\frac{1}{2}\frac{H_0 v_0}{c}\frac{\sigma_1 - \sigma_2}{\sigma_1 + 2\sigma_2}\frac{a^3}{r^3}\sin\theta\cos\varphi - \frac{1}{2}H_0 v_0 r\sin\theta\cos\varphi.$$

Card 3/5

Investigation of electromagnetic ...

In the flow function $\psi = r_1 W_\varphi$, r_1 is the radius of the cross section of the body perpendicular to its axis of rotation and $\vec{W}$ is the vector potential of the velocity. ($\vec{v} = \mathrm{curl}\vec{W}$, $\mathrm{div}\vec{W} = 0$). The first term of (33) depends on the viscosity of the fluid. The second term largely depends on the conductivity level of the body. Φ increases from zero on the body's surface (with $\sigma_1 = \sigma_2$) to $v_0 H_0 a/c$ at a distance $a/\sqrt{Re}$ (boundary layer). Near the burble point a surface potential occurs with $\sigma_1 = \sigma_2$. With $\vec{H}_0 \parallel \vec{v}_0$, $\Phi = 0$, like in ideal fluids. With $\vec{H}_0 \perp \vec{v}_0$ the problem is no longer axially symmetrical. The dependences $E_y(t)$, $h_x(t)$ and $h_z(t)$ found experimentally in an annular mercury channel are similar to the theoretical distributions. The small differences are explained by the various hydrodynamic conditions before and behind the body moving in the real fluid. With critical and supercritical Reynolds numbers the distributions of E_y and h_x become more complex and the turbulence of the fluid in the channel causes an instability of amplitude and pulse shape. Measurements in electrolytes and fluid sodium are desirable. Measurements

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Investigation of electromagnetic ...

of $\vec{E}$ and $\vec{H}$ in strong magnetic fields at high Stuart numbers will supply data on the motion of a body in a fluid with $M^2/Re \gg 1$. The results obtained are of interest for certain magnetohydrodynamic problems, particularly for electric and magnetic fields affecting the motion of satellites and other bodies in conducting media. There are 7 figures.

ASSOCIATION: Magnitnaya laboratoriya Akademii nauk SSSR (Magnetic Laboratory of the Academy of Sciences USSR)

SUBMITTED: March 7, 1962

Card 5/5

DORMAN, L. I.

Dissertation defended for the degree of Doctor of Physicomathematical Sciences at the Physics Institute imeni P. N. Lebedev in 1962:

"Variations of Cosmic Rays."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145

PHASE I BOOK EXPLOITATION SOV/6519

Dorman, Leyb Isaakovich

Variatsii kosmicheskikh luchey i issledovaniye kosmosa (Cosmic-Ray Variations and Space Research) Moscow, Izd-vo AN SSSR, 1963. 1026 p. Errata slip inserted. 2700 copies printed.

Sponsoring Agency: Akademiya nauk SSSR.

Resp. Ed.: S. N. Vernov, Corresponding Member, Academy of Sciences USSR, Professor; Ed. of Publishing House: D. M. Alekseyev; Tech. Ed.: V. G. Laut.

PURPOSE: The book is intended for scientific workers and persons interested in aerospace research, for specialists in the physics of cosmic rays, astrophysics, geophysics, and aeronomy as well as for senior students of related branches.

COVERAGE: The book is a logical continuation of the author's book Cosmic Ray Variations published by Gostekhizdat in 1957, and is devoted to the investigation of space phenomena through the study of the variations of cosmic rays. The vast experimental

Card 1/[illegible]2

Cosmic-Ray Variations and Space Research SOV/6519

material systematized and investigated in the book was obtained from 1957 to 1962 during the IGY and the Year of International Geophysical Collaboration in the global ground-level cosmic-ray network by means of neutron monitors, ionization chambers, counter and scintillation telescopes, balloons, satellites, and sounding rockets. Various hypotheses are made on the connections between phenomena in space, the cosmic-ray variation, and the radiation captured in the cosmic magnetic traps. Cosmic rays are shown to be a sensitive probe for investigating electromagnetic conditions near the earth, in corpuscular streams, in interplanetary space, in the atmosphere of the sun, and in the Galaxy and Metagalaxy. Magnetic quasi-traps in interplanetary space are briefly discussed and an attempt is made to present a general picture of cosmic-ray variations. The author thanks S. N. Vernov and Ye. L. Feynberg for their help and advice, V. L. Ginzburg, N. L. Grigorov, G. T. Zatsepin, S. B. Pikel'ner, Ya. L. Blokh, N. S. Kaminer, O. K. Inozemtseva, I. V. Dorman, L. Kh. Shatashvili, and Ye. V. Kolomeyets for their discussions of problems examined in the book. There are 1046 Soviet and non-Soviet references.

Card 2/32

VERNOV, S.N., otv. red.; DORMAN, L.I., doktor fiz.-matem. nauk, otv. red.; VERSTAK, G.V., red.izd-va; PODOL'SKIY, A.D., red. izd-va; POLENOVA, T.P., tekhn. red.; VOLKOVA, V.Ye., tekhn. red.

[Articles] Sbornik statei. Moskva. No.3. 1961. 220 p. No.5. 1963. 225 p. (MIRA 16:9)

1. Akademiya nauk SSSR. Mezhduvedomstvennyy komitet po provedeniyu mezhdunarodnogo geofizicheskogo goda. VII razdel programmy MGG. Kosmicheskiye luchi. 2. Chlen-korrespondent AN SSSR (for Vernov).

(Cosmic rays)

... BUDILOV, L. I. DORMAN, V. I. IVANOV, Ye. V. KOLMEYETS, L. Y. MIROSHNICHENK

Small Flares and the Propagation of Solar Cosmic Rays in Interplanetary Space.

report submitted for the 8th Intl. Conf. on Cosmic Rays (IUPAP), Jaipur India, 2-14 Dec 1963

.. BOOS, V. V. VISKOV, L. I. DORMAN, Ye. V. KOLOMEYETS, Zh. S. TAKIBAYEV

The calculations of the integral multiplicity for Mu-meson and nucleon component production duet to the different energies of primaries obtained at the top of the atmosphere with different zenith angles.

Report submitted for the 8th Intl. Conf. on Cosmic Rays (IUPAP), Jaipur India, 2-14 Dec 1953

. ALANIYA, O. M. BLOKH, Ya. L. BLOKH, A. M. CHETIYA, L. I. DORMAN
. KANTNER, T. V. KEBULADZE, V. K. KOYAVA, Ye. V. KOLOMEYETS, V. O. K[illegible]IDZE,
. PIVEREVA, M. I. TYASTO

Cosmic Ray Effects During Magnetic Storms

Report submitted for the 8th Intl. Conf. on Cosmic Rays (IUPAP), Jaipur India, [illegible] 1963

L. I. DORMAN

Cosmic Ray Variations

report submitted for the 8th Intl. Conf. on Cosmic Rays (IUPAP), Jaipur India, 2-14 Dec 1963

ACCESSION NR: AT3012806 S/2961/63/000/005/0005/0061

AUTHORS: Dorman, L. I.; Kolomeyets, Ye. V.; Pivneva, V. T.; Sergeyeva, G. A.

TITLE: Variations of the intensity and anisotropy of cosmic rays during world-wide magnetic storms and auroras at low latitudes

SOURCE: AN SSSR. Mezhduvedomst. geofizich. komitet. 7 razdel program. MGG: Kosmicheskiye luchi. Sb. statey, no. 5, 1963, 5-61

TOPIC TAGS: cosmic rays, cosmic ray intensity, cosmic ray anisotropy, Forbush effect, corpuscular streams, low latitude aurora, primary particle energy, Forbush effect spectrum, diurnal cosmic ray variation, magnetic storm

ABSTRACT: The various effects of magnetic storms and cosmic rays for 1957--1959 are investigated using data of the world network of neutron monitor stations. These include the spectra of the Forbush

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ACCESSION NR: AT3012806

effect, the properties of the corpuscular streams which cause magnetic storms, the diurnal and semidiurnal variations and low-latitude auroras (in Kazakhstan). It is found that for primary particle energies ~15 BeV the Forbush-effect spectra can be represented by constants ranging from 0.08 to 0.2. In some cases the amplitudes of the diurnal and semidiurnal variations of the cosmic rays can increase or decrease during magnetic storms, and the phase may shift towards either the morning or evening hours. For the majority of cases, however, there is a tendency for the amplitude to increase during magnetic storms and for the maximum time to shift to the morning. Auroras are observed at low latitudes mainly during the minimum of the Forbush effect at the instant when the magnetic field is minimal. The low-latitude auroras are connected with the corpuscular streams that approach the earth most closely. The various experimental data are interpreted. Although the phenomena considered are very complicated and the variation of the cosmic-ray anisotropy exhibits peculiarities in each specific case the observed data do

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ACCESSION NR: AT3012806

display a common feature, namely a general tendency for the time of the diurnal-variation first-harmonic maximum of the shift towards the evening hours on going from low to high geomagnetic latitudes. The strongest dependence of the first harmonic maximum time on the geomagnetic latitude is observed in this case before the magnetic storm and after the intensity of the cosmic rays has resumed its normal level. The latitude dependence weakens greatly during the time directly following the principal phase of the magnetic storm. The results are interpreted in light of the hypothesis that there are two sources of anisotropy during magnetic storms, one acting on the cosmic-ray particle trajectories outside the sphere of the influence of the geomagnetic field, and the other a nearby source associated with the asymmetrical variation of the geomagnetic field as the latter interacts with the plasma of the corpuscular streams. Orig. art. has: 66 figures, 19 tables, and 1 formula.

ASSOCIATION: None

Card 3/4

L 17135-65 EEC-4/EWG(v)/EWA(h)/EWT(l)/EEC(t)/FCC Pe-5/Pi-4/Po-4/Pq-4/Pb-4
Pae-2/Peb SSD(h)/AFWL/BSD/SSD/AFMD(c)/AFETR/RAEM(c)/ESD(t) GW/WS

ACCESSION NR: AR4045180 S/0269/64/000/001/0049/0049

SOURCE: Ref. zh. Astronomiya, Otd. vy*p., Abs. 7.51.384

AUTHOR: Dorman, L.I., Inozemtseva, O.I.

TITLE: Disturbances in the solar-diurnal variation and the anomalous increase in intensity of cosmic rays during the period of the magnetic storm of 11 February 1958

CITED SOURCE: Ab. Kosmich. luchi. No. 5. M., AN SSSR, 1963, 62-81

TOPIC TAGS: cosmic ray, magnetic storm, solar diurnal variation, cosmic ray intensity, Forbush decrease, cosmic ray variation, geomagnetic field, cosmic ray anisotropy, corpuscular stream, magnetosphere, solar plasma

TRANSLATION: This paper presents a detailed analysis of observational data on cosmic ray variations during the time of the very strong magnetic storm of 11 February 1958 (accompanied by a considerable increase in cosmic ray intensity at the minimum of the Forbush decrease) for the purpose of detecting a disturbed solar-diurnal variation and discovering a local (lying in the sphere of influence of the geomagnetic field on the trajectory of the particles) and a distant source of diurnal variation. In addition to data

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L 17135-65
ACCESSION NR: AR4045180

om the world network of neutron monitors (40 stations), the authors also used observational data from Cape Town station on variations of cosmic rays incident at an angle of 45° to the vertical from the northern and southern hemispheres. The use of data obtained using crossed telescopes made it possible to demonstrate the appearance of a local source of cosmic ray anisotropy at the time of this storm. In order to detect a diurnal variation from observations by the world network of neutron monitors a correction was introduced for its noncyclic character by the moving averages method. An allowance was made for spurious variations arising as a result of sharp changes in cosmic ray intensity at the time of a Forbush decrease. The authors computed nomograms for finding the effect of an increase at any time of day at any longitude for all observation stations on the assumption that the longitudinal anisotropy of the increase effect is caused by a change in the geomagnetic field at the time of a storm. Similar nomographs were also constructed on the assumption that the longitudinal anisotropy is caused in its entirety by a distant source. Comparison of the theoretical curves with experimental data revealed a simultaneous presence of both sources of anisotropy. In this case, in the middle and low latitudes, the location source was manifested very clearly in the observational data whereas in the high latitudes its role was insignificant. The distant source is related by the authors to the anisotropic

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L 17135-65
ACCESSION NR: AR4046101

effect of solar corpuscular streams on galactic cosmic rays and the local source is related to the direct distortion of the paths and cutoff rigidities of cosmic rays in the earth's magnetosphere, distorted asymmetrically under the influence of solar plasma. According to the analysis in the paper, based on experimental data, the earth's magnetosphere is drawn out considerably in the direction away from the sun (toward the nighttime side) during interaction with a stream of solar plasma (at the time of a magnetic storm). L. Dorman.

SUB CODE: AA, ES ENCL: 00

Card 3/3

ACCESSION NR: AT3012807 S/2961/63/000/005/0082/0102

AUTHORS: Dorman, L. I.; Shatashvili, L. Kh.

TITLE: Cosmic ray variations connected with the rotation of the sun

SOURCE: AN SSSR. Mezhduvedomst. geofizich. komitet. 7 razdel program. MGG: Kosmicheskiye luchi., Sb. statey, no. 5, 1963, 82-102

TOPIC TAGS: cosmic rays, cosmic ray variation, rotation of sun, cosmic ray diurnal variation, 27 day variation, geomagnetic field variation, solar activity variation, Forbush effect, solar wind, magnetic heterogeneity, magnetized plasma radiation

ABSTRACT: A study is made, using neutron-monitor data gathered by the world network during the IGY, of (a) the variations observed from July 1957 through December 1960 in the mean-diurnal values of the intensity of cosmic rays, which are connected exclusively with the rotation of the sun, (b) the tendency towards repetition in the

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ACCESSION NR: AT3012807

geomagnetic activity and the question of the presence of two active longitudes on the sun, (c) the tendency towards repetition in the H component of the geomagnetic field and the fraction of the 27-day variation due to direct variations of the geomagnetic field, (d) the 27-day variations of cosmic rays as connected with the solar activity, (e) the phase shift of various parameters connected with the rotation of the sun, (g) the effect of the sun's rotation on the diurnal variation of cosmic rays and on the variations of the cosmic-ray intensities, and (h) a general discussion of the 27-day variation. It is found that not all the phenomena under consideration display a simultaneous tendency to recur every 27 days, the strongest tendency being manifest by the cosmic ray intensity variations. Several peculiarities of the 27-day variations of the cosmic rays are observed. Questions connected with the determination of the spectrum, stability, influence of the Forbush effect, 27-day variations of the anisotropy, and other cosmic-ray variations connected with the sun's rotation are also discussed. A detailed analysis shows that the ob-

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ACCESSION NR: AT3012807

served peculiarities of the cosmic-ray variations due to the sun's rotations can be attributed to the presence of an asymmetrical solar wind of magnetic heterogeneities, and that the cause of the 27-day variations lies in the rotating asymmetry of the electromagnetic conditions in an interplanetary space of large volume, which includes the earth's orbit. This asymmetry, which is connected in turn with the anisotropic radiation of magnetized plasma in the presence of active longitudes on the sun, produces an integral effect in the cosmic rays, which decreases appreciably with increasing hardness of the particles. "In conclusion, we consider it our pleasant duty to thank Ya. L. Blokh, N. S. Kaminer, E. I. Mogilevskiy, and G. M. Nikol'skiy for participation in the discussion of the results. Orig. art. has: 11 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 22Oct63 ENCL: 00

SUB CODE: PH, AS NO REF SOV: 022 OTHER: 022

Card 3/3

L 17130-65 EEC-4/EWG(v)/EWA(h)/EWT(1)/EEC(t)/FCC Pe-5/Pi-4/Po-4/Pq-4/
Pae-2/Peb/Pb-4 AFWL/BSD/SSD/SSD(b)/AFMD(c)/AFETR/RAEM(c)/ESD(t) GW/WS

ACCESSION NR: AR4015184 S/0269/64/000/007/0050/0050

SOURCE: Ref. zh. Astronomiya. Otd. vyp., Abs. 7.51.388

AUTHOR: Dorman, L. I.; Kolomeyets, Ye. V.; Pivneva, V. T.; Sergeyeva, G. A. 12

TITLE: Anomalously large diurnal and semidiurnal cosmic ray intensity variations of 22 October - 2 November 1959

CITED SOURCE: Sb. Kosmich. luchi. No. 5. M., AN SSSR, 1963, 126-138

TOPIC TAGS: cosmic ray, cosmic ray intensity, cosmic ray variation, solar plasma, solar cosmic ray, galactic cosmic ray, geomagnetic field, cosmic ray diurnal variation, magnetic storm

TRANSLATION: Observational data from 23 stations of the world network of cosmic ray stations have been used to investigate the anomalously large diurnal and semidiurnal cosmic ray intensity variations during the period 22 October - 2 November 1959. The entire observation period was broken down into 5 intervals: 1--quiet days, averaged for 21-22 October; 2, 3, 4--disturbed days separately for 27, 28 and 29 October, respectively; 5--averaged data for the quiet days 1 and 2 November 1959. Data for 30 and 31 October were

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L 17130-65
ACCESSION NR: AR4045184

not used in the analysis because on those days there was a sharp world intensity decrease associated with a large magnetic storm with a sudden commencement. The authors determined the latitudinal and longitudinal distribution of the amplitude and phase of the first and second harmonics of the diurnal variation and also the energy spectrum of the particles responsible for the discussed effects. It is concluded that the cause of the observed diurnal variations cannot be a local source associated with changes in the geomagnetic field. It is more probable that the sought-for cause is the anisotropic modulation of galactic cosmic rays by streams of solar magnetized plasma which engulfed the earth during the period 27-28 October, although only the diffuse part of the plasma streams with a low density of kinetic energy was involved. Bibliography with 6 items. L. Dorman.

SUB CODE: AA, ES ENCL: 00

Card 2/2

ACCESSION NR: AT3012810 S/2961/63/000/005/0139/0141

AUTHOR: Dorman, L. I.; Kolomeyets, Ye. V.

TITLE: Effect of small solar bursts in the hard component of cosmic rays

SOURCE: AN SSSR. Mezhduvedomst. geofizich. komitet. 7 razdel program. MGG: Kosmicheskiye luchi. Sb. statey, no. 5, 1963, 139-141

TOPIC TAGS: cosmic rays, solar flare, cosmic ray burst, hard component burst, superposition of epochs, magnetic disturbance, corpuscular stream, high energy solar particle

ABSTRACT: The effect of bursts in the hard component of cosmic rays was analyzed by the method of superposition of epochs for the stations Cheltenham, Mawson, and Sulphur. Bursts with index 2 and more were chosen in quiet days with low magnetic disturbances. All data were corrected for the barometric effect and in addition the sum of the first and second harmonics, calculated for the preceding day, was subtracted from the observational data. The data for 1951 -- 1961 indicate that the cosmic ray intensity does not increase by more than

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ACCESSION NR: AT3012810

0.4 per cent during the burst. It is shown that the effect of small bursts in the hard component cannot be attributed to meteorological factors and may be due to high-energy solar particles. An experiment decisive from this point of view would be an analysis of the observations of the intensity of the hard component at low latitudes with large cutoff hardness. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 220ct63 ENCL: 00

SUB CODE: PH, AS NO REF SOV: 003 OTHER: 002

Card 2/2

ACCESSION NR: AT3012811 S/2961/63/000/005/0142/0149

AUTHORS: Dorman, L. I.; Kolomeyets, Ye. V.

TITLE: Effect of small individual solar bursts of cosmic rays

SOURCE: AN SSSR. Mezhduvedomst. geofizich. komitet. 7 razdel program. MGG: Kosmicheskiye luchi. Sb. statey, no. 5, 1963, 142-148

TOPIC TAGS: cosmic rays, solar bursts, cosmic ray solar bursts, individual burst analysis, burst group analysis, statistical burst analysis, cosmic ray energy spectrum, particle production in sun

ABSTRACT: In contrast to most earlier investigations, where the effect of small solar bursts (with index 2 and more) was evaluated by statistical analysis of data averaged over many bursts, the author analyzes several individual bursts with an aim at comparing the data on small bursts at the earth's surface with data obtained in the stratosphere and on satellites. The energy spectrum of the solar

Card 1/2

ACCESSION NR: AT3012811

cosmic rays is found to be of the form exp(-n), with n ranging from 4 to 7 at low energies (200--300 MeV) and from 3 to 5 at high energies. The spectrum becomes harder with increasing energy. This variation can be attributed both to the specific nature of the mechanism of generation of particles in the sun and to the peculiarities of their propagation from the sun to the earth. A possible diffusion mechanism for the propagation can be proposed, but further tests are necessary for its confirmation. Orig. art. has: 12 figures and 1 formula and 1 table.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 22Oct63 ENCL: 00

SUB CODE: PH, AS NO REF SOV: 011 OTHER: 004

Card 2/2

L 32004-65 EWT(1)/FCC/EWA(w)/EEC(t)/EEC-4/EWA(h) Pc-4/Pq-4/Pa-5/Pae-2/Peb/
P1-4 ASDA5/SSDA/SSD/AFMDC/AFWL/BSD/AFETR/ESLT/PB-4 GW/WS

ACCESSION NR: AR4046186 S/0269/64/000/007/0050/0051

SOURCE: Ref. zh. Astronomiya. Otd. vyp., Abs. 7.51.391

AUTHOR: Dorman, L.I.; Kulomeyets, Ye. V.; Plyneva, V.T.; Sergeyeva, G.A.

TITLE: Charge in cosmic ray intensity on quiet and magnetically disturbed days

CITED SOURCE: Sb. Kosmich. luchi. No. 5. M., AN SSSR, 1963, 149-153

TOPIC TAGS: cosmic ray, cosmic ray intensity, geomagnetism, stratosphere, upper atmosphere, magnetic storm, Forbush decrease

TRANSLATION: The authors compare the change in cosmic ray intensity on the basis of measurements in the stratosphere over Minneapolis, Murmansk and Moscow, on the one hand, and sea-level data at Ottawa, Churchill and Heretmonceaux on the other. The ratio of the amplitudes of variations for Minneapolis, Murmansk and Moscow varies from 35, 29 and 2, respectively on quiet days to 22, 12 and 4, respectively at the time of magnetic storms. It is shown that: 1) on magnetically quiet days the relative increase of low-energy cosmic ray intensity (up to 0.3 Bev) in the stratosphere exceeds by many times the latitude effect with a cutoff rigidity of ~ 2 Bev; 2) on magnetically disturbed days there is an opposite phenomenon -- in the high latitudes the relative amplitude of the Forbush

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L 32(0)4-65

ACCESSION NR: AR4046184

decrease decreases, but at the lower latitudes (with the cutoff rigidity ~ 2 Bev) it increases almost by a factor of 2. Bibliography with 10 items. L. Dorman.

SUB CODE: AA, ES ENCL: 00

Card 2/2

DORMAN, L.I.; KOLOMEYETS, Ye.V.; KOZAK, L.V.; PIVNEVA, V.T.; SERGEYEVA, G.A.

Fluctuation of cosmic ray intensity during Forbush decrease.
Geomag. i aer. 3 no.2:362 Mr-Ap '63. (MIRA 17:2)

1. Kazakhskiy gosudarstvennyy universitet.

DORMAN, L.I.; IVANOV, V.I.; KOLOMEYETS, Ye. V.; KASHKAROV, I.Ye.

Effect of small bursts in the hard component of cosmic rays.
Geomag. i aer. 3 no.4:752-753 Jl-Ag '63. (MIRA 16:11)

1. Kazakhskiy gosudarstvennyy universitet.

DORMAN, L.I.; SHATASHVILI, L.Kh.

Lunar diurnal variation and the 27-day modulation of cosmic ray anisotropy. Geomag. i aer. 3 no.5:979-981 S-O '63. (MIRA 16:11)

1. Institut geofiziki AN Gruzinskoy SSR.

ACCESSION NR: AP4013148 S/0203/64/004/001/0168/0170

AUTHORS: Dorman, L. I.; Miroshnichenko, L. I.

TITLE: The dependence of the diffusion coefficient of solar cosmic rays on their energy

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 1, 1964, 168-170

TOPIC TAGS: cosmic ray, solar cosmic ray, diffusion coefficient, solar particle, scattering, uniform distribution, scattering center, magnetic cloud, magnetic inhomogeneity, heavy nucleus, magnetic field, proton

ABSTRACT: The authors started from an equation for isotropic spherical diffusion as a first approximation for propagation of solar particles in interplanetary space. They found an expression to define the density of solar cosmic rays on the earth. For a maximum value, this expression is written $t_{max} = R^2/6d$, where R is the radius of the earth's orbit about the sun and d is the diffusion coefficient (a function of the kinetic energy of the particle; its possible dependence on distance to the sun is neglected). It is noted that in making calculations by this formula scattering is significant only for protons and for uniform distribution of scattering centers in the solar system. Consideration of inhomogeneities

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ACCESSION NR: AP4013148

in the distribution of magnetic clouds and of their movement in interplanetary space leads to the conclusion that the diffusion coefficient and scattering depend on the distance from the sun and that the time in which the maximum is achieved depends on the velocity of the magnetic inhomogeneity. It is noted in conclusion that the method based on using the indicated formula contains the basic possibility of distinguishing streams of solar protons from streams of heavier nuclei, because of the lower velocities of nuclei with $z > 1$ in any interplanetary magnetic field (approximately half in a nonrelativistic field) than protons having the same hardness factor. Orig. art. has: 2 figures and 8 formulas.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery* i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves AN SSSR)

SUBMITTED: 14Aug63 DATE ACQ: 02Mar64 ENCL: 00

SUB CODE: AS, PH NO REF SOV: 004 OTHER: 003

Card 2/2

L 63628-65 EWG-4/EWG(j)/EWG(v)/EWA(h)/EWT(1)/EWT(m)/FCC/T Pe-5/Pi-4/Po-4/
ACCESSION NR: AP4031644 Pq-4/Pae-2/Peb UR/0203/64/004/002/0399/0401
IJP(c) GW 523.165

AUTHOR: Dorman, L.I.; Ivanov, V.I.; Kolomeyets, Ye. V.

TITLE: Increases in the hard component of cosmic ray intensity during "small" solar chromospheric flares

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 2, 1964, 399-401

TOPIC TAGS: hard cosmic-ray component, cosmic ray, solar flare, solar chromosphere

ABSTRACT: An analysis is made of 170 flares of two units of intensity or more as reported by a world network of stations registering the hard component of cosmic ray intensity during small chromospheric flares. The method of period superposition is used, and the daily variation is eliminated by subtracting the daily variation from the preceding day. The results, summarized in a table, show that the magnitude of the effect is not larger than 0.1%, or less than reported earlier by the same group of authors. Statistical processing indicates that roughly 75% of the effect at the equator is due to secondary effects which are most probably of high atmospheric origin. "The authors thank M. Murzabekov for the help during the processing of the results and

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L 63628-65

ACCESSION NR: AP4031644

2

N.S. Kaminer for useful discussions." Orig. art. has: 1 formula, 2 figures, and 1 table.

ASSOCIATION: Kazakhskiy gosudarstvennyy universitet (Kazakh State University)

SUBMITTED: 09May63 ENCL: 00 SUB CODE: AA, ES

NO REF SOV: 009 OTHER: 004

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Card 2/2

L 6620-65 EWG(j)/EWP(m)/AR/ES/FCC/T IJP(c)/AMC(b)/ASD(mp)-2/ESD(gs)

ACCESSION NR: AP4031645 S/0203/64/004/002/0402/0404

AUTHOR: Dorman, L. I.

TITLE: Correlation coefficients and the interpretation of underground observations of cosmic ray variations

SOURCE: Geomagnetism i aeronomiya, v. 4, no. 2, 1964, 402-404

TOPIC TAGS: cosmic ray variation, primary particle, underground cosmic ray observation, meson decay, ionization loss, primary particle variation

ABSTRACT: Direct computations of the integral multiple generation of μ-mesons and the corresponding correlation coefficients for underground observations based on the latest theory of the elementary interaction of nucleons (with loss in ionization and meson decay considered) indicate that correlation coefficients determined previously have considerably overestimated the effect of high energies and underestimated the effect of low energies. Recomputation of the results obtained from underground observations using correlation coefficients should therefore indicate a faster decrease in the primary variation

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L 6620-65
ACCESSION NR: AP4031645

amplitude as the energy of the primary particles increases. As a result, all types of modulation effects virtually disappear for primary energies larger than 100 Bev. These findings are important in the observation of the various modulation mechanisms of galactic cosmic rays in interplanetary space. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 06Dec63 ATD PRESS: 3014

SUB CODE: ES, NP NO REF SOV: 013 ENCL: 00

OTHER: 000

Card 2/2

L 11354-65 EWT(1)/EWG(v)/FCC/EEC-4/EEC(t)/EWA(h) Pc-4/Pe-5/Pq-4/Pae-2/Peb/Pi-4
Pb-4/SSD/ESD(t)/AFWL/AFETR/AFMDC GW/WS

ACCESSION NR: AP4046101 S/0103/64/004/006/0940/0944

AUTHOR: Dorman, L. I., Miroshnichenko, L. I.

TITLE: Character of the spatial and temporal distribution of solar cosmic rays in interplanetary space

SOURCE: Geomagnetism i aeronomiya, v. 4, no. 6, 1964, 940-944

TOPIC TAGS: sun, solar cosmic ray, cosmic ray, interplanetary space, cosmic ray anisotropy

ABSTRACT: Under certain assumptions, the rate of decrease in the intensity of solar particles in interplanetary space will be related to various factors. Thus, the decrease in intensity will be accelerated if there is an effective boundary of the region of diffusion. The effective radius of the region of diffusion will depend eventually on particle energy. Decreasing with time, the intensity will also be accelerated if the diffusion coefficient depends on the distance to the sun, or if the diffusion coefficient is quite strongly dependent on particle energy, as well as by the movement of magnetic nonuniformities away from the sun. The authors give the results of computations of the density

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L 11354-65

ACCESSION NR: 4046291

of solar cosmic rays as a function of time and distance from the sun for χ (diffusion coefficient) = 10^{20}, 10^{21}, 10^{22}, 10^{23} $cm^2 \cdot sec^{-1}$ (which is equivalent to investigation of four different energy values); u = 0, 10^7, $3.16 \cdot 10^7$, 10^8, $3.16 \cdot 10^8$ $cm \cdot sec^{-1}$; r = 0.1, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0 a.u.; and t = 10^3, $3.16 \cdot 10^6$, 10^7, $3.16 \cdot 10^7$ sec. The results are shown in Figures 1-4 of the Enclosure. Fig. 1 of the Enclosure shows the dependence of the density of solar particles in the earth's orbit on χ (that is, on their energy) for u = 0 (solid curves) and $3.16 \cdot 10^7$ $cm \cdot sec^{-1}$ (dashed curve). For these same values of u the solid and dot-dash curves in Fig. 2 of the Enclosure represent the spatial-temporal distribution of solar cosmic rays of identical energy ($\chi = 10^{22}$ $cm^2 \cdot sec^{-1}$). Fig. 3 of the Enclosure shows the temporal change in the density of solar particles of different energies in the earth's orbit; the solid curves were drawn without taking into account the movement of magnetic nonuniformities (u = 0) and the dashed curves with an allowance for such movement (u = $3.16 \cdot 10^7$ $cm \cdot sec^{-1}$). For particles of identical energy ($\chi = 10^{22}$ $cm^2 \cdot sec^{-1}$) the change in their density for different velocities of these nonuniformities will occur in conformity to Fig. 4 of the Enclosure; the solid curves apply to the earth's orbit and the dashed curve to r = 3 a.u. The computations apparently give no basis for concluding that the decrease in intensity of solar particles has an exponential character, but it is shown that as a result of the radial movement of magnetic nonuniformities away from the sun the intensity of particles of a burst is incident on the earth more rapidly than indicated by the

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L 11354-65
ACCESSION NR: AP4046291 2

$\sim t^{-3/2}$, especially for low-energy particles and for sufficiently large values of t. It is also shown that the degree of anisotropy of solar cosmic rays decreases with time. "The authors wish to thank N.S. Kaminer for useful discussion". Orig. art. has: 13 formulas and 4 figures.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery*i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, the Ionosphere and Radio Wave Propagation, AN SSSR)

SUBMITTED: 04Jan64 ENCL: 04 SUB CODE: AA

NO REF SOV: 008 OTHER: 010

Card 3/7

L 11354-65

ACCESSION NR: AP4046[illegible]

ENCLOSURE: 01

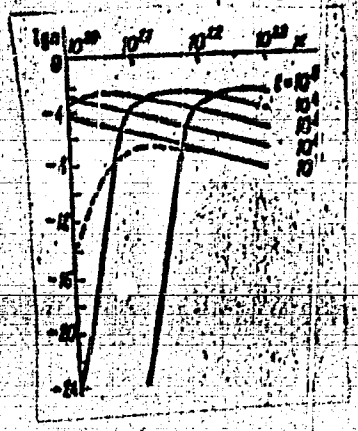

Fig. 1. Relationship between the density and energy of solar particles in the earth's orbit.

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L 11354-65

ACCESSION NR: AP4040291

ENCLOSURE: 02

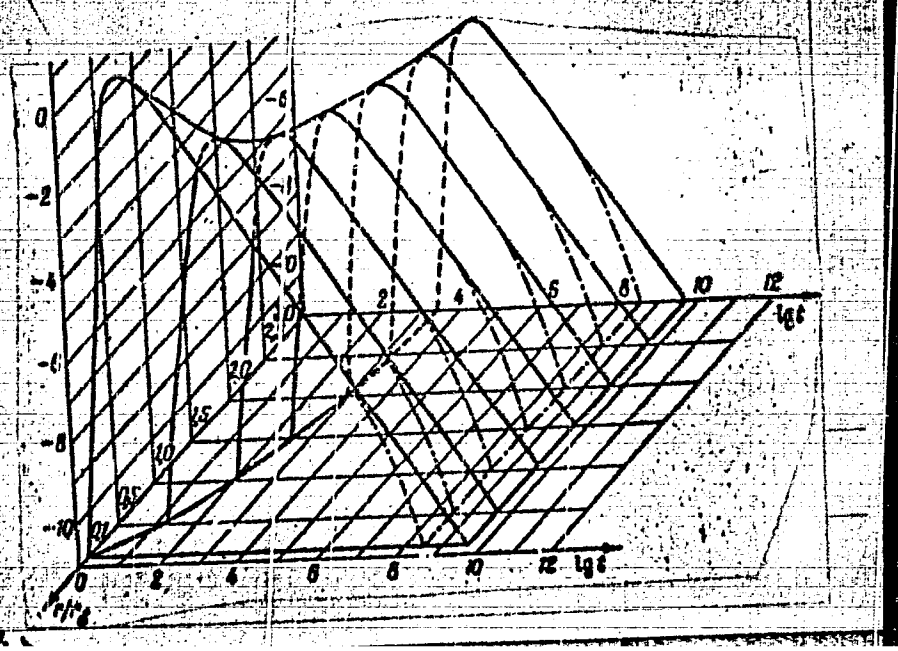

Fig. 2. Spatial and temporal distribution of solar cosmic rays of identical energy

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ACCESSION NR: AP4046291

ENCLOSURE: 03

Fig. 3. Temporal distribution of the density of solar particles of varying energy in the earth's orbit.

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L 11354-65

ACCESSION NR: AP4046201

ENCLOSURE: 04

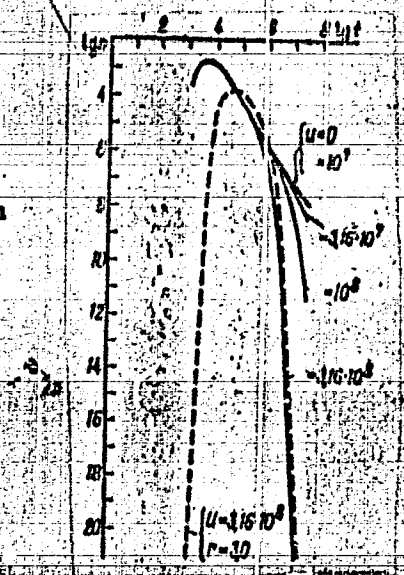

Fig. 4. Relationship between the velocity of nonuniformities and the density of particles with identical energy.

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L 20028-65 EEC-4/EWG(v)/EWA(h)/EWT(l)/EEC(t)/FCC Pe-5/Pi-4/Pe-4/Pq-4/
Pae-2/Pab/Pb-4 SSD/APWL/ASD(a)-5/AFMD(c)/AFETR/ESD(t) GW/WS

ACCESSION NR: AP5000528 S/0203/64/004/006/1113/1116

AUTHOR: Dorman, L.I., Inozemtseva, O.I.

TITLE: Certain characteristic features of cosmic ray anisotropy during geomagnetic storms

SOURCE: Geomagetizm i aeronomiya, v. 4, no. 6, 1964, 1113-1116

TOPIC TAGS: geomagnetic storm, Forebush effect, cosmic ray, nucleonic component, harmonic analysis, diurnal anisotropy

ABSTRACT: Sudden magnetic storms usually produce a Forebush effect, but in a few rare cases the geomagnetic storms have not been accompanied by a Forebush effect at most observatories. A detailed investigation into cosmic ray anisotropy in October 1960 involved the use of data obtained by intersecting the telescopes of the Moscow observatory (55°28' N., 37°19' E) and that of Tokyo-Itabashi (35°45' N., 139°43' E). The statistical error for the Moscow and Itabashi telescopes was the same, amounting to 0.6% in a 2-hour period of observation. To make the analytical results more accurate, the data on the diurnal events were averaged for every 3 consecutive days between 21 October and 1 November, 1960. At the Itabashi station the changing amplitude of

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L 20028-65
ACCESSION NR: AP5000528

3

...e diurnal wave was less conspicuous in comparison with the "south" and "north", but in the eastern and western directions there was a clearly definable counter-clockwise rotation of the vectors during the expected restoration period following the "Volgebush drop". "In conclusion, we consider it our duty to thank S. N. Vernov for his comments on the work, and Z. I. Solov'yev for his assistance in the processing of the observation data." Orig. art. has: 3 figures.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery* i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, the Ionosphere and Radiowave Propagation, AN SSSR)

SUBMITTED: 12Mar64 ENCL: 00 SUB CODE: ES

NO REF SOV: 005 OTHER: 007

Card 2/2

L 21186-65 EWT(l)/EWG(j)/EWG(v)/EWA(h)/EWT(l)/EWT(m)/EEC(t)/ECC/T Pb-4/Pe-5/Pi-4/
Po-4/Pq-4/Pae-2/Pab ASD(a)-5/AFWL/SSD/AEIC(a)/ESD/AFMDC/AFETR/ESD(gs)/ESD(t)
IJP(c) — GM-2/MS
ACCESSION NR: AP5002086 S/0048/64/028/012/1942/1958

AUTHOR: Dorman, L. I.

TITLE: Variations in the intensity of cosmic rays /Report, All-Union Conference on the Physics of Cosmic Rays held in Moscow 1-10 Oct 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.12, 1964, 1942-1958

TOPIC TAGS: cosmic radiation, cosmic ray intensity

ABSTRACT: The paper is a combination review and discussion of analysis of the by now ample data (reports of the world network of cosmic ray stations, balloon and satellite data, etc.) on the variations in intensity of cosmic radiation with a view to extracting significant information on conditions in outer space and on the interaction, macroscopic and microscopic, of cosmic rays. For the purpose of isolating extra-terrestrial variations, the observed variations are classified as variations of atmospheric origin (Class I), variations of geomagnetic origin (Class II) and variations of extra-terrestrial origin (Class III). The first two, being fairly well understood, can be allowed for. Class III variations, in turn, are subdivided into modulation effects, solar cosmic radiation and variations of galactic origin.

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L 21186-65
ACCESSION NR: AP5002096

The various effects involved in the fluctuations in the three subclasses are discussed and some general regularities and pertinent laws are adduced. Among the topics touched upon are 11-year variations, cosmic ray density gradients in space, the Forbush effect, the difference between solar and galactic cosmic rays, retardation of cosmic rays in space, variation of the energy spectrum exponent in the high-energy range, etc. [Abstracter's note: The author has published a couple of books and many papers on the variation of cosmic rays, and this paper appears to be a review of some of his recent results and conclusions.] Orig.art.has: 22 formulas and 5 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00

SUB CODE: AA NR REF SOV: 015 OTHER: 013

2/2

[redacted]

DOBIN, I.L.; TYLKO, V.I.

Effect of the equatorial current on variations in the geomagnetic cutoff rigidity of cosmic ray particles. Geom. i aer. 2 no.3:538-542 My-Je '62. (MIRA 15:8)

[redacted], L.I., [redacted] L.Ph.

The diurnal modulation of gold [illegible] rays. Its methodology on [illegible] observation data, and the interpretation of the results based on a dynamic model of the variations. Izv. AN SSSR Ser. fiz. 29 no.12:2073-[illegible] D '65. (MIRA 19:1)

1. Institut geofiziki AN Turkmenskoy SSR.

L 21190-65 EEC-4/EWG(v)/EWA(h)/EWA(s)-2/EWT(l)/EEC(t)/FS(v)-3/FCC/FSP(h)/EWA(d)/
FSS-2/ Pn-5 Pi-4/Po-4/Pq-4/Pae-2/Pab AFWL/SSD/ESD(t) IJP(c)/BM-2/MS
ACCESSION NR: AP4002099 S/0048/64/028/012/1978/1984

AUTHOR: Dorman, L. I.; Miroshnichenko, L. I.

TITLE: Concerning the character of propagation of solar cosmic rays in interplanetary space /Report, All-Union Conference on the Physics of Cosmic Rays held in Moscow 4-10 Oct 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.12, 1964, 1978-1984

TOPIC TAGS: cosmic ray burst, cosmic radiation

ABSTRACT: The present analysis of some recent experimental (satellite and other) data on solar cosmic rays was undertaken in view of the increasing interest in the nature of propagation of solar cosmic radiation. On the basis of the now commonly accepted diffusion model the density of solar cosmic ray particles is described by an inhomogeneous equation of the type:

$$\frac{\partial n}{\partial t} = \varkappa \nabla^2 n + F(r, t); \quad n(r, 0) = 0; \quad -\infty < r < +\infty; \quad t > 0,$$

where n is the density of solar particles, $\varkappa$ is the diffusion coefficient, and

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L 21190-65
ACCESSION NR: AP5002099

F(r,t) is the density of the particle source. Analysis indicates that the density n should have a maximum at $t = r^2/6\chi$, and the density should fall off according to the $t^{-3/2}$ law (at a fixed r: for example, the radius of the Earth's orbit). Some data are consistent with this (the solar c.r. burst of 23 Feb 1956), but some more recent data are better described by an exponential law: $n = ae^{-t/T}$, where T is a time constant that initially is of the order of tens of minutes and later of the order of hours. Further analysis of the data indicates that the coefficient of diffusion may depend not only on the energy of the particles but also on the distance from the Sun and the azimuthal angle of emission of the particles. The adduced formulas are used for an approximate analysis of some recent data, including the data from Explorer XII. The analysis indicates that the diffusion coefficient is a power function of the energy. Consideration is given to evaluation of the anisotropy of the solar c.r. flux; mathematical analysis shows that the anisotropy may vary with time, which is borne out by the available data on large solar c.r.bursts. Orig. art.has: 14 formulas and 6 figures.

2/3

BLOKH, G.M.; BLOKH, Yu.L.; [redacted]

Some results of calculations of the [illegible] of variations in a dynamic model of the [illegible] effect. Izv. AN SSSR, Ser. fiz. 29 no.12:1965-1968 D '65. (MIRA 19:1)

ALANIYA, M.V.; DORMAN, L.I.; KOIAVA, V.K.; KASHIADZE, T.V.; NORIDZE, V.G.; CHKHETIYA, A.M.

Effect of magnetic storms on cosmic rays at maximum and minimum solar activity. Izv. AN SSSR Ser. fiz. 28 no.12:1992-1996 D '64 (MIRA 18:2)

L 52195-65 EWG(j)/EWT(1)/EWG(v)/FCC/EEC-4/EEC(t)/T/EWA(h)/EWT(m) Po-4/Pe-5/Pq-4/
Pae-2/Peb/Pl-4 IJP(c) GS

ACCESSION NR: AP5017046 UR/0048/64/028/012/2022/2025

AUTHOR: Boos, E. G.; Viskov, V. V.; Dorman, L. I.; Kulomeyets, Ye. V.; Takibayev, Zh. S.

TITLE: Bonding coefficients for various cosmic ray components [19] Report of the All-Union Conference for the Physics of Cosmic Rays, held in Moscow, 4-10 October, 1963

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 28, no. 12, 1964, 2022-2025

TOPIC TAGS: cosmic ray, particle interaction, particle motion, astrophysics

ABSTRACT: Bonding coefficients which are used to study variations in cosmic rays are computed on the basis of the character of an elementary event of the interaction of a primary nucleon with nuclei of atmospheric atoms in which the spatial distribution of a nuclear cascade in the atmosphere is taken into account. This problem was solved earlier in the one-dimensional approximation for a vertical flow of primary particles. In this article the angular spread of particles is considered. The bonding coefficients are derived for the mu-meson component. It is assumed that a primary particle loses the same

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L 52195-65

ACCESSION NR: AP5017046

amount of energy in each interaction event, since only pi-mesons are generated. The contribution of delta nucleons to the generation of pi-mesons is neglected.

Orig. art. has: 17 formulas

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: AA, NP

NO REF SOV: 002 OTHER: 000 JPRS

Card 2/2

L 23405-65 EWT(1)/EWG(v)/FCC/EEC-4/EEC(t)/EWA(h) Po-4/Pe-5/Pq-4/Pae-2/Peb/Pi-4
AM/WS
ACCESSION NR: AP5002100 B/0048/64/028/012/1993/1996

AUTHOR: Alaniya, M. V.; Dorman, L. I.; Kolava, V. K.; Kebuladze, T. V.; Koridze, V. G.; Chkhetiya, A. K.

TITLE: Influence of magnetic storms on cosmic rays during maximum and minimum solar activity

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 28, no. 21, 1964, 1993-1996

TOPIC TAGS: cosmic ray, magnetic storm, Forbush effect, solar variation, cosmic ray intensity

ABSTRACT: The parameters which characterize the association between the effects of cosmic rays and the phases of magnetic storms are: the increase of cosmic ray intensity before the magnetic storm, the global distribution of the Forbush effect, and solar diurnal variations. Data for studying the correlations between these two phenomena were taken from observations made during the IGY. Four magnetic storms of world-wide character were discussed. The intensity of cosmic rays

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L 23405-65
ACCESSION NR: AP5002100

for the soft and hard components is represented graphically in the original article for magnetic storms from 13 to 31 August 1958. The intensity of the cosmic rays increased before the storm, reaching a maximum during the daytime. The amplitude of the intensity increase was greater at higher elevations than at sea level. Discrepancies between experimental and theoretical results were observed both for sea level and mountain elevations. Orig. art. has: 3 figures. [EG]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: AA

NO REF SOV: 010 OTHER: 002 ATD PRESS: 3174

Card 2/2

27644 52769-65)/EWT(l)/EWG(v)/EEC(k)-2/EEC(b)/EWA(h)/EWP(k)/EWP(v)/EWP(t)/EWP(z)/EWP(b)/EWA(c) Pab/Pl-4 GW

ACCESSION NR: AT5009979 UR/3010/65/000/014/0116/0127

AUTHOR: Dorman, L. I.

TITLE: Variations in cosmic rays during the IGY and the electromagnetic properties of outer space

SOURCE: AN SSSR. Mezhduvedomstvennyy geofizicheskiy komitet. Geofizicheskiy byulleten', no. 14, 1965, 116-127

TOPIC TAGS: cosmic ray intensity, IGY cosmic ray measurement, cosmic ray variation, Forbush effect, cosmic ray anisotropy, magnetic storm

ABSTRACT: Variations in cosmic ray intensity and related events have been studied using the abundant data collected in the Soviet Union and elsewhere during the IGY. Some 400 fundamental studies carried out by Soviet scientists and briefly surveyed in this article cover the classification of cosmic ray variations and the elucidation of their nature, the 11-year changes, the 27-day effect, the solar-diurnal variation, magnetic storms, the propagation of solar particles through interplanetary space, cosmic flares through interplanetary space, cosmic flares and the related safety problems during flights in outer space, the Forbush effect, and the anisotropy of cosmic rays in connection with the problem of their energy spectrum

Card 1/2

L 52769-65
ACCESSION NR: AT5009979

22

and high-energy nuclear interactions. "Leading specialists Ya. L. Blokh, Ye. S. Glokova, O. I. Inozemtseva, N. S. Kuminer, V. K. Kolaya, Ye. V. Kolomeyets, D. D. Krasil'nikov, G. F. Krymskiy, A. I. Kuz'min, A. A. Luzov, G. V. Skripin, A. A. Stepanyan, V. F. Tulinov, M. I. Tyasto, K. K. Fedchenko, A. N. Charakhch'yan, T. N. Charakhch'yan, L. Kh. Shatashvili, G. V. Shafer, and Yu. G. Shafer, among others, participated in these studies. Corr. member of the AN SSSR Prof. S. N. Vernov and Prof. Ye. L. Feynberg coordinated and scientifically guided these studies throughout the IGY and earlier." Orig. art. has: 24 formulas, 2 figures, and 4 tables.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: AA, ES

NO REF SOV: 018 OTHER: 002

Card 2/2

L 12992-65 EEC-4/EWG(j)/EWG(v)/EWA(h)/EWT(1)/EWT(m)/EEC(t)/FCC/T Pe-5/Pi-4/Peb/
Po-4/Pq-4/Pae-2 IJP(c) GW-2

ACCESSION NR: AP5005185 S/0203/65/005/001/0040/0047 57 B

AUTHOR: Dorman, L. I.

TITLE: Simultaneous amplitude-phase modulation of periodic variations of cosmic rays and the properties of satellites

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 1, 1965, 40-47

TOPIC TAGS: cosmic ray, cosmic ray variation, cosmic ray modulation, amplitude modulation, phase modulation

ABSTRACT: Virtually all observed types of periodic cosmic ray variations experience amplitude and phase modulation associated with the earth's rotation on its axis and revolution around the sun, the sun's own rotation, the cycle of solar activity, and other factors. The amplitude and phase modulation of periodic variations leads to the appearance of satellites whose frequencies in many cases coincide with the frequencies of a number of expected real variations; sidereal-diurnal, lunar-diurnal and others. Amplitude and phase modulation have usually been considered separately in earlier studies and as a result the two satellites with the frequencies $\omega_0 \pm \omega_1$ appearing in the first approximation have been identical in amplitude. This result was used in determining whether the investigated variations

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L 42992-65

ACCESSION NR: AP5005185 O

contained a true sidereal-diurnal or lunar-diurnal wave. It has been asserted that if both satellites are equal in amplitude there is no true sidereal-diurnal wave, while if the amplitudes of the satellites are different there is a true sidereal-diurnal wave. In this paper, it is shown that this simple result is correct only in a case when there is only amplitude or only phase modulation; when both types of modulation occur simultaneously the properties of satellites are considerably more complex. The simultaneous occurrence of both types of modulation (with different phases) is considered in detail and precise formulas for satellites are derived for the case when true waves are present. When the amplitudes and phases of satellites are determined with sufficient accuracy, it becomes possible to solve the inverse problem as well (determination of the modulation parameters and true waves). Orig. art. has: 24 formulas and 1 table.

ASSOCIATION: none

SUBMITTED: 05Aug64 ENCL: 00 SUB CODE: ES

NO REF SOV: 006 OTHER: 011

Card 2/2 mc

DORMAN, L.I.; NOSOV, Yu.O.

Theory of charged particle scattering by cosmic magnetic fields of simplest type. Geomag. i aer. 5 no.1:155-159 Ja-F '65.
(MIRA 18:4)

1. Polyarnyy geofizicheskiy institut, Kol'skiy filial AN SSSR.

DORMAN, L.I.; KORIDZE, V.G.; SHATASHVILI, L.Kh.

Increases in cosmic ray intensity not associated with visible formations on the sun. Geomag. i aer. 5 no.1:159-161 Ja F '65. (MIRA 18:4)

1. Institut geofiziki AN Gruzinskoy SSR.

ALANIYA, M.V.; DORMAN, L.I.; SHATASHVILI, L.Kh.

Character of the distribution of cosmic ray intensity fluctuations for successive instants. Geomag. i aer. 5 no.1:161-162 Ja-F '65. (MIRA 18:4)

1. Institut geofiziki AN GruzSSR.

L 53661-65 EWT(l)/EWG(v)/FCC/EEC-4/EEC(t)/EWA(h) Po-4/Pe-5/Pq-4/Pae-2/Pel/
Pi-4 GW

ACCESSION NR: AP5014099 UR/0203/65/005/003/0377/0383
523.877

AUTHOR: Dorman, L. I.; Miroshnichenko, L. I.

TITLE: On the solar cosmic rays in the flare on 28 September 1961

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 3, 1965, 377-383

TOPIC TAGS: chromospheric flare, solar active region, solar cosmic ray, magnetic storm, differential spectrum, proton, diffusion coefficient

ABSTRACT: A chromospheric flare in an active solar region occurred on 28 September 1961 and was recorded in Honolulu. This flare was accompanied by x-radiation and solar cosmic rays. A magnetic storm started 46 hr after the flare. An artificial satellite at a distance of 80,000 km from the earth measured the differential spectrum of protons with an energy more than 2 Mev for two days after the flare. Many experimental data and theoretical computations testify that the diffusion coefficient increases with increasing particle energy. A comparison of the theoretical curve of the diffusion coefficient with curves obtained by experiments shows good agreement. The diffusion coefficient of particles with an energy of 500 Mev was equal to that obtained in the stratosphere, measuring solar cosmic particles of another flare.

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L 53661-65
ACCESSION NR: AP5014099

The size of magnetic nonhomogeneities, distances between them, and the field intensity depend upon the distance of the particles from the sun. One can assume that the translocation on scattering and the diffusion coefficient increase with the departure from the sun. The intensity of solar cosmic rays decreases by the exponential law after the maximum has been attained. The number of particles of various energies leaving the sun may be determined graphically from the dependence of the number of particles upon the particle energy, and from this the differential spectrum of particles may be found. A deformation of the particle spectrum takes place because of the energy decrease. Orig. art. has: 4 figures and 3 formulas. [EG]

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves, AN SSSR)

SUBMITTED: 02Jun64 ENCL: 00 SUB CODE: AA

NO REF SOV: 007 OTHER: 011 ATD PRESS: 4013

Card 2/2

DORMAN, L.I.; KOIAVA, V.K.; KOREDZE, V.G.; SHATASHVILI, L.Kh.

The 27-day variation of the geomagnetic field disturbance on zero-days of cosmic-ray intensity. Geomag. i aer. 5 no.3:566-568 My-Je '65. (MIRA 18:5)

1. Institut geofiziki AN Gruzinskoy SSR.

L 65298-65 EWT(l)/EWT(m)/FCC/T/EWA(h) IJP(c) GW

ACCESSION NR: AP5020995 UR/0203/65/005/004/0666/0672
523.165

AUTHORS: Dorman, I. V.; Dorman, L. I.

TITLE: Proton and α-particle modulation in regions of small intensity and the cosmic ray spectrum in the galaxy

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 4, 1965, 666-672

TOPIC TAGS: proton, alpha particle, cosmic ray, galaxy, beam modulation, spectrum analysis

ABSTRACT: From alpha particle and proton spectra the governing parameters of the modulation mechanism are investigated, which in turn sheds some light on the intensity gradients of cosmic rays from interplanetary space. The study is carried out in three parts. In part I, the 11-year variation in cosmic rays and the modulation of proton and α-particle beams are analysed in the low energy range. The modulated primary cosmic ray spectra are represented by

$$D_{\text{мод}}(R) / D_0(R) = e^{-a(R)/v}$$

which, when combined with the velocity ratio of protons to α-particles, yields

$$\frac{D_{\text{мод. }p}(R)}{D_{\text{мод. }\alpha}(R)} = K \exp\left[\frac{a(R)}{v_p}\left(\sqrt{\frac{R^2+4}{R^2+1}} - 1\right)\right],$$

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ACCESSION NR: AP5020995

3

where R is the ray intensity (hardness). From this, the transport path for scattering of 1 Bev particles at $r_{max} \sim 100$ is calculated to be 3×10^{11} cm. In part II, the spectra of galactic cosmic rays at low energy are analyzed during minimum solar activity. It is shown that the famous "kink" observed in the cosmic ray spectra is wholly due to modulation of cosmic rays in interplanetary space. Finally, in part III, the above results are used to calculate the expected cosmic ray intensity gradients during July, 1963 for particle intensities of 1 and 0.7 Bev. These yield 3.3%/1 a.e. for protons and 5.3%/1 a.e. for α-particles in the first case, and 4.1%/1 a.e. for protons and 7%/1 a.e. for α-particles in the second case. Orig. art. has: 13 formulas, 1 table, and 1 figure.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln, AN SSSR (Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation, AN SSSR)

44,55

SUBMITTED: 050ct64 ENCL: 00 SUB CODE: AA

NO REF SOV: 006 OTHER: 009

Card 2/2

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041101(

L 4490-66 EWT(l)/EWT(m)/FCC/T/EWA(h) WJP(c) GW

ACC NR: AP5024661 SOURCE CODE: UR/0048/65/029/009/1781/1783

AUTHOR: Blokh, Ya.L.; Dorman, L.I.; Inozemtseva, O.I.; Leonov, V.Kh.; Mazaryuk, Ye.A.

ORG: none

TITLE: Counter telescope for recording the total cosmic ray flux with enhanced statistics /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AN SSSR, Izvestiya. Seriya fizicheskaya, v. 29, no. 9, 1965, 1781-1783

TOPIC TAGS: particle counter, cosmic ray telescope, cosmic ray measurement, cosmic ray anisotropy

ABSTRACT: The authors discuss the design of a crossed counter telescope for recording the total cosmic ray flux. A design goal was to achieve a statistical accuracy of 0.1 % in 2 hours of counting. Design calculations for 25 different geometries were performed by a generalization of the method previously given by Ya.L.Blokh (Sb. "Kosmicheskiye luchi", No.3, ser. Rezul'taty MGG, str. 80. Izd. AN SSSR, 1961) for calculating directional curves for cubic geometry. The instrument was designed without lead to simplify the construction and to permit recording of the electron component, which is most sensitive to anisotropy effects. The final design consists of 16 identical 60 x 60 x 90 cm^3 elements containing 10 counters each and arranged with a 10 cm spacing between elements in a 270 x 270 x 90 cm^3 rectangular parallelepiped with the

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ACC NR: AP5024661

square faces horizontal. Counts are to be recorded in five principal directions (north, south, east, west, and vertical) and in four supplementary diagonal directions. The half-width of the directional diagram is 24°, the effective zenith angle is 33°, and the acceptance angle is 0.3 sterad. The sensitive area is approximately 4 m^2 in each direction, and a statistical accuracy of 0.14 % is anticipated for a 2 hour run. Correction will be made for changes in the accidental coincidence rate due to changes in the cosmic ray flux. Orig. art. has: 2 figures.

SUB CODE: NP/ SUBM DATE: 00/ ORIG REF: 004/ OTH REF: 002

Card 2/2

L 6944-66 EWT(1)/FCC/EWA(h) GW

ACC NR: AP 5026223 SOURCE CODE: UR/0048/65/029/010/1810/1812

37
B

AUTHOR: Dorman, L.I.; Miroshnichenko, L.I.

ORG: none

TITLE: Solar cosmic rays from the flare of 28 September 1961 and the properties of interplanetary space (Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964)

SOURCE: An SSSR. Izvestiya, Seriya fizicheskaya, v.29 no.10, 1965, 1810-1812

TOPIC TAGS: cosmic ray, solar flare, physical diffusion, interplanetary space, nonhomogeneous magnetic field

ABSTRACT: The measurements with Explorer 12 of the cosmic ray intensity during the 28 Sept. 1961 Solar flare were compared with the predictions of the author's diffusion theory of cosmic ray propagation (Geomagnetism i aeronomiya, 5, No.3,337 (1965). Agreement could be obtained by assuming that the particles began to be emitted when the x-ray burst reached its maximum some 15 minutes after the onset of the solar flare. The scattering mean free path was almost independent of particle energy for energies from 10 to 500 MeV, and was approximately 7.5×10^{11} cm. The differential emission spectrum was found to be $5.6 \times 10^{34} E^{-2}$ protons/MeV. where E is the kinetic energy. A lower limit of 5×10^{-6} G was found for the strength of the magnetic field inhomo-

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ACC NR: AP 6026223 O

geneities. If one assumes on the basis of measurements with Mariner 2 that the strength of the magnetic field inhomogeneities is 10^{-4} G one finds that a linear dimension of such an inhomogeneity is approximately 4×10^{10} cm, which is about half the distance between the inhomogeneities. Orig. art. has: 8 formulas.

SUB CODE: AA/ SUBM DATE: 00/Oct 65 ORIG. REF: 001 OTH REF: 001

beh

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L 9603-66 EWT(l)/FCC/EWA(h) GW
ACC NR: AR5020396 UR/0313/65/000/008/0035/0035

37
B

SOURCE: Ref. zh. Issledovaniye kosmicheskogo prostranstva, Abs. 8.62.231

AUTHOR: Dorman, L.I.

TITLE: Cosmic rays variations during the IGY period and the electromagnetic properties of cosmic space

CITED SOURCE: Geofiz. byul. Mezhduved. geofiz. kom-t pri Prezidiume AN SSSR, no. 14, 1964, 116-127

TOPIC TAGS: space radiation, cosmic ray, cosmic ray measurement

TRANSLATION: The basic results of studies conducted during the IGY on cosmic rays variations and their relation to electromagnetic conditions in cosmic space are given. A brief list of variations classification is included. References: 20.

SUB CODE: 03 ENCL: 00

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DORMAN, L.I.; OKULOV, Yu.I.

Motion of a magnetic particle in the earth's dipole field. Izv. AN SSSR.Ser.fiz. 29 no.10:1862-1864 O '65.
(MIRA 18:10)

DORMAN, L.I.; INOZEMTSEVA, O.I.; MAZARYUK, Ye.A.; SOLOV'YEVA, Z.I.

Modulation of the solar diurnal effect and the possibility for establishing variations in cosmic ray intensity as measured in sidereal time. Izv. AN SSSR.Ser.fiz. 29 no.10:1898-1901 O '65. (MIRA 18:10)

ALANIYA, M.V.; DORMAN, L.I.; SHATASHVILI, L.Kh.

The 27-day variations in cosmic ray anisotropy on data of observations of the neutron component at mountain stations of the world network. Izv. AN SSSR.Ser.fiz. 29 no.10:1916-1919 O '65.

(MIRA 18:10)

1. Institut geofiziki AN GruzSSR.

L 0947-66 EWT(1)/FCC/EWA(h) GW

ACC NR: AP 5026235 SOURCE CODE: UR/0048/65/029/010/1920/1922

AUTHOR: Dorman, L.I.; Kebuladze, T.V./Koridze, V.G. 26 B

ORG: none

TITLE: World-wide cosmic ray intensity increases and their relation to geomagnetic disturbances /Report, All-Union Conference on Cosmic Ray Physics held at Apatity, 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya.Seriya fizicheskaya, v.29, no.10, 1965, 1920-1922

TOPIC TAGS: Cosmic ray intensity, cosmic ray variation, magnetic storm

ABSTRACT: The authors have analyzed the world-wide cosmic ray intensity increases that occurred during the magnetic storms of 18 August 1957, 13 September 1957, 11 February 1958, and 17 August 1958. In the present paper the results of the analysis of the 13 September 1957 storm are discussed; the analyses of the remaining storms led to similar results. Cosmic ray intensity increases were observed not only at the minimum of the Forbush effect, but also at the beginning of the main phase of the storm when the horizontal component of the terrestrial magnetic field was rising. The maximum increase of cosmic ray intensity was observed at different times at different stations. The cutoff rigidity at the maximum of a cosmic ray intensity increase did not correlate with the longitude or latitude of the station at which it was observed. The relation between the amplitude of a cosmic ray

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ACC NR: AP 5026235

intensity increase and the cutoff rigidity was in agreement with the theoretical curves of L.I.Dorman, Ya. L.Blokh;,and N.S.Kaminer (Sb. Kosmicheskiye luchi, No.4, str. 5. Izd. AN SSSR. M., 1961). It is concluded that cosmic ray intensity increases accompanying magnetic storms are complex in nature and not to be explained solely by changes of the geomagnetic cutoff rigidity. Orig. art. has: 3 figures.

SUB CODE: AA, ES SUBM DATE: 00/--Oct65 ORIG.REF: 003 OTH REF.001

leh

2/2

ALANIYA, M.A.; DOLMAN, L.I.; KORINOV, V.G.; KOLAVA, V.S.; CHAVCHAVILI, L.Kh.

Planetary distribution and possible interpretation of sudden increases in cosmic ray intensity, according to data of the world network of stations, unrelated to the visible solar formations. Izv. AN SSSR.Ser.fiz. 29 no.10:1923-1926 O '65.
(MIRA 18:10)

1. Institut geofiziki AN GruzSSR.

L 2991-66 FSS-2/EWT(1)/FS(v)-3/FCC/EWA(d)/EWA(h) TT/GS/GW
ACCESSION NR: AT5023633 UR/0000/65/000/000/0514/0528

AUTHOR: Blokh, Ya. L.; Dorman, L. I.; Kurnosova, L. V.; Logachev, V. I.; Platonov, G. F.; Razorenkov, L. A.; Sinitsina, V. G.; Suslov, A. A.; Fradkin, M. I. 76 B+1

TITLE: Some results of the study of cosmic ray nucleons by the Elektron-2 satellite

SOURCE: Vsesoyuznaya konferentsiya po fizike kosmicheskogo prostranstva. Moscow, 1965. Issledovaniya kosmicheskogo prostranstva (Space research); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 514-528

TOPIC TAGS: satellite, radiation, cosmic ray, cosmic radiation, nuclear particle, nucleon/Elektron 2 satellite

ABSTRACT: Included in the instrumentation of the Elektron-2 satellite (launched, Jan 1964; apogee, 68,000 km) was a combination of internal and external counters designed to register nuclear components of primary cosmic radiation. The design and calibration of this apparatus is described, and some results of partially-reduced data are discussed. One counter mounted on the external surface of the satellite was a combination of the Cerenkov and scintillation types which responded to nucleons in the atomic number range $2 \leq Z \leq 30$. The internal counter was a Cerenkov

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ACCESSION NR: AT5023633

type, registering at the discrete levels of $Z \geq 2$, $Z \geq 5$, and $Z \geq 15$. All counters were shielded and were designed to register only particles with energies ≥ 600 Mev/nucl. Fig. 1 of the Enclosure gives the basic schematic of the external counter combination. The authors detail the method used to calibrate the photomultiplier outputs in terms of the Z-range of input excitation; for example, for the type FEU-35 external counter, the anode output characteristic corresponded to the range from $Z = 4$ to $Z = 21$, and the output of the 7th dynode, to the range $Z = 6$ to $Z = 28$. The calibration technique was to excite a SiC electroluminescent diode with a high-voltage, short-duration (4—30 nsec) thyratron pulse, providing the phototube with a light input similar to a counter input. Early results from these primary particle counters, obtained during the IQSY, have been a useful supplement to analogous satellite data from the 1959-1962 period, during which solar activity was undergoing the transition from maximum to minimum. Comparative results are seen in Fig. 2, which shows an almost twofold increase in nuclear particles recorded near the solar activity minimum. Table 1 compares data from one orbit of Elektron-2 to that of the 1959 and 1960 satellites and the 1962 Mars-1 probe. To date only data for the $Z \geq 15$ particles have been reduced enough for statistical analysis. A large increase in incidence of this size particle was noted during solar eruptions observed in the course of the Elektron-2 flight. Orig. art. has: 18 figures, 1 table, and 1 formula. [SH]

ASSOCIATION: none
Card 2/6

L 2991-66

ACCESSION NR: AT5023633

SUBMITTED: 02Sep65 ENCL: 03 SUB CODE: AA, NP

NO REF SOV: 003 OTHER: 000 ATD PRESS: 4109

Card 3/6

L 2991-66

ACCESSION NR: AT5023633 ENCLOSURE: 01

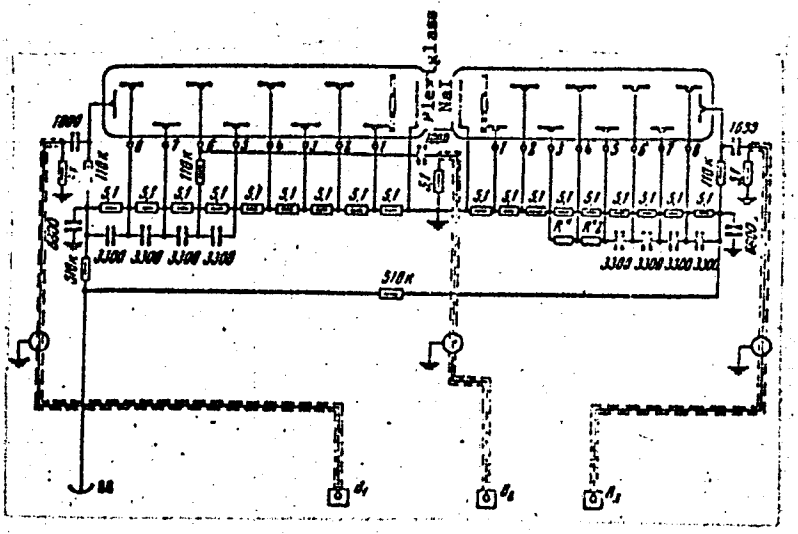

Fig. 1. External counter

B_1, B_2 - Phototube output from Cerenkov counter;
B_3 - from scintillation counter.

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L 2991-66

ACCESSION NR: AT5023633

ENCLOSURE: 02

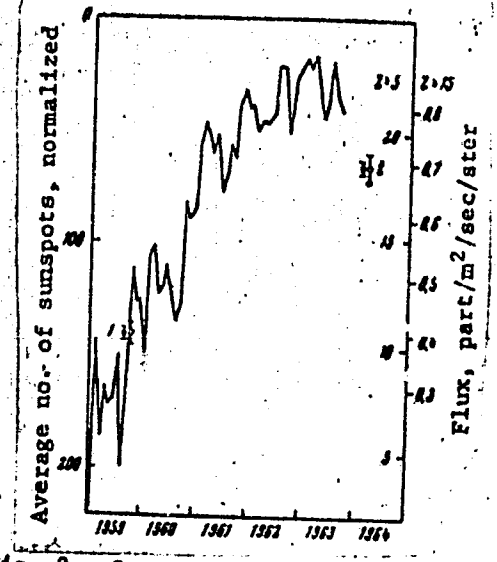

Fig. 2. Sunspot activity vs nuclear flux

Solid circles - Z ≥ 5; open circles - Z ≥ 15; 1 - Lunik-2; 2 - Elektron-2.

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L 2991-66

ACCESSION NR: AT5023633 ENCLOSURE: 03

0

Vehicles	Nuclear flux, particles/m^2/sec/ster		
	$z > 3$	$z > 6$	$z > 15$
Elektron-2	343,4± 1,4	18,3±0,3	0,60±0,06
Lunik-2	150,6±1,3	10,6±0,3	0,4±0,05
Korabl'-3	129,2±12,9	9,8±0,7	—
Mars-1	333±21	—	—

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