

SAVEL'YEVA-VASIL'YEVA, Ye.A.

Familial local torsion dystonia. Zhur. nevr. i psikh. 62  
no.5:672-674, '62. (MIRA 15:6)

1. Kafedra nervnykh bolezney (zav. -- prof. Ye.F. Davidenkova)  
Leningradskogo pediatricheskogo meditsinskogo instituta.  
(DYSTONIA)

DAVIDENKOVA, Ye. F.; KELER, N. N.; SAVEL'YEVA-VASIL'YEVA, Ye. A.;  
NIKOLAYEV, V. P.

Clinical characteristics of serous meningitis caused by intestinal  
viruses. *Pediatrics* no.6:3-8 '62. (MIRA 15:6)

1. Iz kafedry nernvnykh bolezney (zav. - prof. Ye. F. Davidenkova)  
i virusologicheskoy laboratorii (zav. V. P. Nikolayev) Lenin-  
gradskogo pediatricheskogo meditsinskogo instituta (dir. Ye. P.  
Semenova).

(MENINGITIS) (VIRUS DISEASES)

9(2)

SOV/112-59-1-1729

Translation from: Referativnyy zhurnal. Elektrotehnika, 1959, Nr 1, p 245 (USSR)

AUTHOR: Savel'zon, M. D., Rudol'fi, G. R., and Yakubovich, S. I.

TITLE: Automating the Control of Electric Parameters of Radio Equipment

PERIODICAL: Radiotekhn. proiz-vo, 1957, Nr 15, pp 3-33

ABSTRACT: Comparing a voltage that depends on the parameter being controlled with a reference voltage (comparing their amplitudes and the error-signal polarity) is the principal method of quality control. Methods for controlling resistors, DC and AC voltages, and simple components directly connected to measuring circuits are described. A particular emphasis is made on the quality control of transformers and reactors. Block diagrams are presented, and automatic-control desks are described; the desks comprise switching devices, comparison circuits, automatic devices ensuring operation sequence, signaling systems, and power-supply sources. Desks for automatically controlling wiring, cables, transformers, stabilized-rectifier output, and

Card 1/2

SOV/112-59-1-1729

Automating the Control of Electric Parameters of Radio Equipment  
frequency-response characteristics are described. Automation of controlling  
operations has increased productivity 15-30 times. Bibliography: 6 items.

S.A.B.

Card 2/2

SAVEANU, Th.; IBANESCU, I.; VASILIU, M.

Influence of regosity upon the mass transfer in the pellicular flow  
of the waves of a liquid. Studii chim Iasi 11 no.1:148-157 '60.

(EEAI 10:3)

(Film coefficients (Physics)) (Mass transfer)  
(Wave mechanics) (Liquids)

SAVENCU, Simon

H-4

RUMANIA/Chemical Technology. Chemical Products and Their Application, Part 1. - Processes and Apparatus of Chemical Technology.

Abs Jour: Referat. Zhurnal Khimiya, No 10, 1958, 32824.

Author : Simon Savencu, Tiberiu Golgoțiu, Angela Luca, Julieta Linda, Ana Bucur, Iancu Hincu.

Inst : Jassi Polytechnical Institute.

Title : Corrosive Properties of Some Soils in Moldavia.

Orig Pub: Bul. Inst. politehn. Iași, 1956, 2, No 3-4, 101-104.

Abstract: A comparative characteristic of aggressivity of various soils in the Jassi region with reference to steel, cast iron and lead is presented. The electrochemical measurements showed that the corrosion is exclusively of an electrochemical character under the experiment conditions. The least corrosion was observed in the case

Card : 1/2

17

PARSHIN, Yu.A.; Koba, V.I.; SAVENKO, A.L.

Remote safety device for placing the neutron source in the logging tool of the STP--NGG<sub>2</sub>-57 apparatus. Sbor.luch.rats.predl. pt. 2: 51-53 '63. (MIRA 17:5)

1. Glavnoye upravleniye geologii i okhrany nedr pri Sovete Ministrov BSSSR.

SATENKO, A. V.

54\* (The Use of Preparation M-1 in Storing Potatoes.)  
Primenenie preparata M-1 pri khraneni kartofella. A. V.  
Savenko. Sad i Ogorod, 1954, no. 9, Sept., p. 37-39.  
Vitamin C, starch, and sugars are preserved over a period of  
months by 3.5% dust of methyl ester of  $\alpha$ -naphthylacetic acid.  
Photographs, table.



BUROV, D.I., doktor sel'skokhoz. nauk, prof.; LAYKOV, I.A., kand. sel'sel'skokhoz. nauk; LUKANCHEV, D.N., nauchnyy sotrudnik; SAVENKO, A.V.

Fall plowing in the southeast. Zemledelie 26 no.7:25-28 J1 '64.  
(MIRA 18:7)

1. Kuybyshevskiy sel'skokhozyaystvennyy institut (for Burov). 2. Pen-  
zenskaya oblastnaya gosudarstvennaya sel'skokhozyaystvennaya opytnaya  
stantsiya (for Laykov, Lukanchev, Savenko).

KRUTIKHOVSKAYA, Zoya Aleksandrovna; ZAVOYSKIY, Vladimir  
Nikolayevich; PODOLYANKO, Svetlana Mikhaylovna;  
SAVENKO, Boris Yakovlevich; SUBBOTIN, S.I., akademik,  
otv. red.; SERDYUK, O.P., red.

[Magnetization of the rocks of iron ore formations of  
the Greater Krivoy Rog and Kursk Magnetic Anomaly] Na-  
magnichenost' porod zhelezorudnykh formatsii Bol'shogo  
Krivogo Roga i KMA. [By] Z.A.Krutikhovskaia i dr. Kiev,  
Naukova Dumka, 1964. 178 p. (MIRA 18:2)

1. Akademiya nauk URSR, Kiev. Instytut geofizyky.

SAVENKO, A.N., inzh.

Electrification of the first section of a railroad line in the  
Soviet Far East. Trans. stroil. 13 no. 12911-12 (1963)  
(MIRA 1967)

KRUTIKHOVSKAYA, Z.A. [Krutikhovs'ka, Z.O.]; SAVENKO, B.Ya.

Tracing the fault zone by geophysical methods. Geol.zhur. 21 no.6:  
58-66 '61. (MIRA 15:2)

1. Institut geofiziki AN USSR.  
(Dnieper Valley—Faults(Geology))(Dnieper Valley—Magnetic  
prospecting)

L 27996-66 EWA(h)/EWT(1) GW  
ACC NR: AT6005987 (N)

SOURCE CODE: UR/3169/65/000/001/0087/0185

AUTHOR: Lebedev, T. S. (Candidate of geological-mineral sciences); Shapoval, V. I.;  
Savenko, B. Ya.

49  
48  
B+1

ORG: none

TITLE: Physical properties of bottom deposits in the equatorial belt of the Atlantic Ocean

SOURCE: AN UkrSSR. Geofizicheskiy sbornik, no. 1(12), 1965. Stroyeniye zemnoy kory i fizicheskiye svoystva gornyykh porod (Structure of the earth's crust and physical properties of rocks), 87-105

TOPIC TAGS: ocean dynamics, longitudinal wave, shock wave propagation, ocean property

ABSTRACT: Elastic, electrical, and magnetic properties of samples collected during the XV voyage of the Mikhail Gomonosov research vessel in the western Atlantic are investigated. Using the formula

$$V_{Li} = \sqrt{\frac{E(1-\sigma)}{\rho(1+\sigma)(1-2\sigma)}}$$

and certain corrections (taking into consideration the finite dimensions of the medium) the propagation velocities of longitudinal waves ( $V_L$ ) were evaluated, where  $V_{Li}$

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L 27996-66

ACC NR: AT6005987

is the velocity of propagation of longitudinal waves in an infinite medium,  $E$  is Young's modulus,  $\rho$  is the sample density, and  $\sigma$  is the Poisson coefficient. The electrical resistivity of the sample was investigated using the formula

$$R_x = R - \frac{\rho_0}{S_1} (L - l),$$

and some additional concepts where  $R_x$  is the resistivity of the sample,  $R$  is the resistivity of both the sample and the solution,  $L$  is the distance between two electrodes,  $l$  is the sample length and  $S_1$  is the cross section of the solution column. The measurement apparatus consisted of 2 electrodes and used an alternating current of 1000 cps. Magnetic susceptibilities of all collected samples were investigated by using a balanced H-shaped magnetic bridge as a pickup. The data show that 1) longitudinal ( $P_L$ ) waves of samples saturated with ocean water have a propagation velocity of 1300-1600 m/sec and that the propagation velocities for grayish ooze, white ooze and yellowish foraminiferal ooze are 1580, 1510 and 1450 m/sec, respectively; 2) the resistivities of bottom deposits in the western equatorial belt of the Atlantic are dependent mainly on the lithologic and mechanical properties of the deposits varying from 0.5-0.9  $\Omega$ . The foraminiferal ooze, however, has resistivities up to 9 $\Omega$ ; 3) the magnetic susceptibilities of the bottom deposits vary from 1-40  $\cdot 10^{-6}$  CGSM; and 4) the vibratory motions of the ship affect the reliability of seismic evaluations. Orig. art. has: 2 tables, 7 figures.

SUB CODE: 08/

SUBM DATE: 29Aug64/

ORIG REF: 018/

OTH REF: 012

Card 2/2

SAVENKO, Gennadiy Gavrilovich; ZHEREBKOV, I.V., red.

[Operation and maintenance of electrical equipment]  
Ekspluatatsiia i remont elektroinstrumenta. Rostov-na-  
Donu, Rostovskoe knizhnoe izd-vo, 1961. 59 p.  
(MIRA 18:4)

SAVENKO, G. P.

"Mechanization of terrace levelling by means of terracing plows"

Ogneupory, No. 9, 1949



SAVENKO, G. P.

PA 153759

USSR/Engineering - Tracks, Railroad

Oct 49

"Mechanizing the Shifting of Railroad Tracks," G. P. Savenko, 3 pp

"Ogneupory" No 10

Describes railroad-track shifters used by Voronezh Ore Adm, giving their operational capacity. Two railroad-track shifters for normal gauge were received in 1947 from Magnitogorsk Ore-Mining Plant. They were put in operation after certain modifications and installation of GAZ automobile motors. Voronezh Ore Adm has designed and constructed two other track shifters, one for 900-mm gauge with GAZ motor, the other for 750-mm gauge, operated by 153759

USSR/Engineering - Tracks, Railroad (Contd) Oct 49

electric motor. The 900-mm gauge track shifter moves the track 280-350 mm in one cycle; the 750-mm track shifter, 220-250 mm. Table gives main specifications of track shifters. Includes photographs.

153759

31. VERNOV, I. I.

✓ E 52771-65 FSS-2/EWT(1)/FS(s)/EWG(v)/FCC/EWA(d)/EEC-l/EEC(t)/EWA(h) Po-l/  
Pd-1/Pg-5/Pq-l/Pac-l/Pae-2/Peb, P1-l TT/GW-2  
UR/3010/65/000/014/0096/0109 69

ACCESSION NR: AT5009977

AUTHOR: Vernov, S. N., Chudakov, A. Ye., Gorchakov, Ye. V., Logachev, Yu. I., 841  
Nesterov, V. Ye., Savenko, I. A., Shavrin, P. I.

TITLE: The radiation belts of the Earth ✓

SOURCE: AN SSSR. Mezhdudomstvennyy geofizicheskiy komitet. Geofizicheskiy byulleten', no. 14, 1965, 96-109

TOPIC TAGS: radiation belt, radiation belt anomaly, cosmic ray measurement, Mars 1  
satellite, Luna 4 satellite ✓

ABSTRACT: This survey article, based mostly on published Soviet and Western papers, discusses the discovery and study of radiation belts, outlines their structure, describes the discovery of radiation belt anomalies, and presents some results of the study of cosmic rays beyond the boundaries of the magnetosphere. This last part contains graphs describing the intensity of cosmic radiation recorded by station Mars 1 as a function of its distance from the Sun, the counting rate of the gas-discharge counter STS-5 on Mars 1 and the stratosphere (at 64° latitude) over the November 1962 - January 1963 period, and the counting rate of the STS-5 counter on the Luna 4 satellite station and in the stratosphere during the first half of April of 1963. Orig. art. has: 16 figures and 2 tables.

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L 52204-65 EWT(1)/EWG(v)/FCC/EEC-4/EEC(t)/ETA(h) Po-4/Pe-5/Pq-4/Pae-2/Peb/Pi-4

GW ACCESSION NR: AP5017047 IR/0048/64/028/012/2045/2048 5/B

AUTHOR: Vernov, S. N.; Savenko, I. A.; Shavrin, P. I.; Mesterov, V. Ye.; Pisarenko, N. F.; Basilova, R. N.

TITLE: Study of cosmic rays at high altitudes [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, 2045-2048

TOPIC TAGS: cosmic ray, astrophysics, satellite data analysis

ABSTRACT: Measurements of the intensity of charged particles that were conducted beyond the limits of atmosphere yielded values for the intensity which exceeded many times the intensity of the primary cosmic rays. Two hypotheses for the nature of this "excess" energy are examined on the basis of changes in the counting rate of the STS-5 counter on the Kosmos-4, Vostok-5, and Vostok-6 satellites during the period from August 1960 to June 1963. The variation and geographic distribution of the intensity were recorded at altitudes of 200-300 kilometers, and analysis of the counting rate showed that the change in the counting rate is the same as that observed in cosmic rays in the atmosphere.

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L 52204-65

ACCESSION NR: AP5017047

Examination of the geographic distribution of the counting rate of the STS-5 showed a unique relationship between the counting rate and the threshold magnetic hardness of the point of measurement.

Orig. art. has: 3 graphs, 2 tables

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: AA, NP

NO REF SOV: 004

OTHER: 002

JPRS

*llc*

Card 2/2

VERNOV, S. N., GORCHAKOV, Ye. V., LOGACHEV, Yu. I., NESTEROV, V. E., PISARENKO, N. F.,  
SAVENKO, I. A. and SHAVRIN, P. I.

"Investigations of Radiation During Flights of Satellites, Space  
Vehicles and Rockets" \*

Report presented at the International Conference on Cosmic Rays  
and Earth Storm, 4-15 Sep 61, Kyoto, Japan.

*same title submitted 12<sup>th</sup> Intl. Astronautical Cong.  
Wash D.C. 1-7 Oct 61*

32717  
S/560/61/000/009/007/009  
D045/D114

17.1400

AUTHORS: Savenko, I. A., Pisarenko, N. F., and Shavrin, P. I.  
TITLE: Dosimetric measurements on the second Soviet space vehicle  
SOURCE: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli, No. 9, Moscow, 1961, 71-77

TEXT: Dosimetric measurements taken on board the second Soviet space vehicle, launched on August 19, 1960, are studied and discussed. The ship was equipped with two scintillation counters and two gas-discharge counters. One of the scintillation counters and two gas-discharge counters. vehicle and was used for registering soft electrons with an energy of up to 30 keV. The other scintillation counter, used for registering  $\gamma$ -quanta and charged particles, and the TCC-5 (TSS-5) and CTE-5 (STS-5) gas-discharge counters were installed inside the vehicle beside the capsule containing the experimental animals. The results of measuring radiation intensity over one section of the flight trajectory are shown in fig. 1. An analysis of the readings of the external scintillation counter shows that the radiation contained in the radiation belts is anisotropic, the energy flow under a layer

X

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32717

S/560/61/000/009/007/009

D045/D114

Dosimetric measurements on ...

of matter  $2 \cdot 10^{-3}$  g.  $\text{cm}^{-2}$  being approximately equal to  $10^{10}$   $\text{ev} \cdot \text{cm}^{-2} \text{sec}^{-1}$ . The dose of radiation absorbed within the vehicle totalled, on the average, 7 mrad per day. Radiation registered in the area of the geomagnetic equator was shown to consist of scarcely-ionized charged particles and  $\gamma$ -quanta with a mean energy of not more than  $6 \cdot 10^5$  ev. Since, with increasing latitude, these readings change by approximately the same degree, this deduction also holds true for the polar regions. An analysis of the readings obtained established that the radiation belts were located nearly 320 km from the Earth's surface. A figure is included showing the varying distribution of intensity of absorbed radiation over different areas of the Earth. The highest quantity of absorbed radiation (50 mrad/day) was registered near the coast of Brazil. The presence of protons suggested that this area was part of the inner radiation belt. Discussing the composition of the total absorbed dose, the authors state that 80% of it consisted of primary and secondary charged particles of cosmic origin, 15% consisted of all types of  $\gamma$ -radiation, and 5% of protons of the inner radiation belt. The RBE values for the last two components were no greater than 1 and 10 respectively; if the RBE value for charged cosmic particles is accepted as 7 (exact values

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32718  
S/560/61/000/009/008/009  
D045/D114

9,6150

21,6000

AUTHORS: Papkov, S. F., Pisarenko, N. F., Savenko, I. A., Tupikin, A. F.,  
and Shavrin, P. I.

TITLE: Radiometric equipment on the second Soviet space vehicle

SOURCE: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli. No. 9,  
Moscow, 1961, 78-85

TEXT: Radiometric equipment installed on the second Soviet space vehicle  
for measuring the intensity of ionizing radiation and for determining the  
absorbed dose is described. A block diagram of the transmitter system is  
given in fig. 3. The scintillation counter (A) registered (1) charged par-  
ticles penetrating the walls of the vehicle, (2)  $\gamma$ -quanta of more than 25  
keV, and (3) the energy release of the above-mentioned particles. The CTS-5  
(STS-5) gas discharge counters (B) registered charged particles. The other  
scintillation counter (B) measured the energy flow of comparatively soft  
charged particles. The operational theory of the transmitter system and  
separate elements of the electronic system, operating on different types of  
semi-conductor triodes and diodes, are described and illustrated. Before

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D045/D114

Radiometric equipment on ...

that all equipment was still in good working order. Professor S. N. Vernov, G. S. Vil'dgrube, A. G. Nikolayev, Yu. I. Logachev, and N. N. Goryunov are thanked for their assistance in the research work. There are 5 figures and 1 Soviet reference.

SUBMITTED: April 3, 1961

Card 3/3

3.2420 (2806, 1049, 1482)

33306  
S/560/61/000/010/004/016  
D299/D302

17.2406  
AUTHORS:

Vernov, S. N., Savenko, I. A., Shavrin, P. I.,  
Nesterov, V. Ye., and Pisarenko, N. F.

TITLE:

Outer radiation belt of the earth at 320 km  
altitude

SOURCE:

Akademiya nauk SSSR. Iskusstvennyye sputniki  
Zemli. no. 10. Moscow, 1961, 34-39

TEXT: The investigations carried out by means of the 2nd  
and 3rd Soviet artificial satellites indicated the existence of  
an outer radiation belt, sharply delimited by the high-latitude  
region. The scintillation- and Geiger-counters on board the  
2nd Soviet Sputnik permitted a detailed study of the outer radi-  
ation belt in the vicinity of the earth and its delimitation as  
a function of longitude. The autonomous memory-device on board  
the Sputnik yielded continuous data on radiation intensity at  
altitudes of 306 - 339 km over the entire terrestrial globe for

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33306

S/560/61/000/010/004/016  
D299/D302

Outer radiation belt of...

of the radiation, the readings of the scintillation- and Geiger-counters were compared. Hence, it was found that the radiation in question is gamma-radiation with energies of the order of 100 - 300 kev. The mean energy of the secondary electrons, arising in the single crystal by interaction with the gamma-radiation, is of the order of  $10^5$  ev. The clear connection between the zones of increased intensity in the Northern and Southern Hemispheres and the nature of the radiation and its energy are proof that the recorded increase in intensity is due to electrons of the outer radiation belt. In general, no direct relation was observed between the intensity and the strength of the magnetic field. This is apparently due to the short lifetime of electrons of the outer radiation belt at the altitudes under consideration compared to the drift-time around the earth. An estimate of the lifetime of electrons with  $E = 300$  kev yielded the value of  $10^6 - 10^8$  sec.; hence, the hypothesis of local acceleration of electrons within the geomagnetic field is

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33307

S/560/61/000/010/005/016  
D299/D302

5:2420 (1049, 2806, 1482)

17 2400  
AUTHORS:

Vernov, S. N., Savenko, I. A., Shavrin, P. I.,  
and Pisarenko, N. F.

TITLE:

Observation of inner radiation belt at an  
altitude of 320 km in the region of the south-  
Atlantic magnetic anomaly

SOURCE:

Akademiya nauk SSSR. Iskusstvennyye sputniki  
Zemli. no. 10. Moscow, 1961, 40-44

TEXT: In contradistinction to the other zones of increased  
radiation-intensity (which form the outer belt), the magnetic  
anomaly near the Brazilian coast cannot be related to the outer  
radiation belt owing to its geographical position and to the  
presence of a large number of penetrating particles in the radi-  
ation. A map shows the regions of increased intensity and, in  
particular, the points at which the intensity exceeded 3.6

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33307

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D299/D302

Observation of inner...

tion belts, very clearly observed in the Northern Hemisphere by means of the 3rd Soviet Sputnik, is practically non-existent in the region of the Brazilian anomaly. These facts may shed light on the origin of the outer radiation belt. There are 2 figures, 1 table and 7 references: 3 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: A. J. Dessler, J. Geophys. Res., 64, 713, 1959; S. Yoshida, G. H. Ludwig, J. A. Van Allen, J. Geophys. Res., 65, 807, 1960; J. A. Van Allen, L. A. Frank, Nature, 183, 430, 1959; J. A. Van Allen, L. A. Frank, Nature, 184, 219, 1959.

SUBMITTED: May 23, 1961

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33308  
S/560/61/000/010/006/016  
D299/D302

Cosmic-ray equator...

physical phenomena on its position. Thereby, it is no longer necessary to introduce barometric temperature and temporal-variation corrections. The equipment of the 2nd Soviet Sputnik contained a Geiger counter, an autonomous memory-device, and telemetering apparatus. The memory device permitted measuring the latitude dependence of primary cosmic radiation at each intersection of the equator. In processing the data, the empirical formula describing the latitude dependence was constructed only from experimental points for latitudes below 40°. Twenty-two latitude curves, obtained from various intersections of the geographical equator, were used to determine the position of the minima of cosmic-ray intensity (i.e., the equator of cosmic radiation). The obtained equator of cosmic radiation is incompatible with a dipole model of the geomagnetic field. The obtained equator is in good agreement with that calculated by Quenby and Weber, as well as with that calculated by Kellogg and Schwartz. There are 1 figure and 8 non-Soviet-bloc

X

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SAVENKO, I. A.

33316  
S/560/61/000/010/014/016  
D299/D302

11.1540  
AUTHORS:

Grigorov, N. I., Zhuravlev, D. A., Kondrat'yeva  
M. A., Rapoport, I. D., and Savenko, I. A.

TITLE:

Search for antimatter in cosmic radiation and  
space

SOURCE:

Akademiya nauk SSSR. Iskusstvennyye sputniki  
Zemli. no. 10. Moscow, 1961, 96-97

TEXT: An emulsion flask--containing 489 emulsion layers of  
type 5P (BR), size 10 x 10 cm<sup>2</sup>, thickness 400 μ--was placed  
on the 2nd Soviet Sputnik. The flask was exposed for about 24  
hours at an altitude of 300 km. Brought back to earth, the  
flask was chemically treated and then analyzed. The analysis  
was carried out by means of the microscope МБН-2 (MBI-2) with  
total magnification 105. Thereby, the multi-charge nuclei and  
"stars" created by these nuclei, which were stopped in the

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D299/D302

Search for antimatter...

emulsion, were observed. In a volume of 656 cm<sup>3</sup> of emulsion, 442 ordinary nuclei were found, as well as 320 "stars." None of the "stars" possessed the characteristics pertaining to annihilation of multi-charge particles which come to rest. Assuming that antinuclei have the same energy spectrum as ordinary nuclei, and taking into consideration that out of 442 multi-charge nuclei not a single anti-nucleus was found, it follows that the fraction of antinuclei with  $Z > 2$  in cosmic radiation does not exceed 0.23% of ordinary nuclei of the same charge. A similar result was obtained by D. M. Haskin et al (Ref. 1: Trudy Mezhdunarodnoy konferentsii po kosmicheskim lucham (International Conference on Cosmic Radiation), v. III. Izd-vo AN SSSR, 1960, p. 138). Assuming antimatter to be scattered in the solar system as individual atoms, it is possible to make an upper estimate of antimatter density as follows: The flow of gamma-quanta with energy of the order of  $10^8$  ev is

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Search for antimatter...

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$J_\gamma \approx 2 \cdot 10^{30} \bar{n}_{\pi^0} \bar{p}_a \text{ cm}^{-2} \cdot \text{sec}^{-1}$ , where  $\bar{n}_{\pi^0}$  is the mean number of  $\pi^0$ -mesons formed by the annihilation of the anti-nucleus. As an upper (greatly over-rated) estimate for  $J_\gamma$ , it is possible to take a flow of gamma-quanta which would give rise (at geomagnetic latitude  $40^\circ$ ) to a charged-particle flow with energy  $E > 10^8 \text{ ev}$ , provided all the particles are considered as electrons. Hence,  $J_\gamma < 10^{-1} \text{ cm}^{-2} \text{ sec}^{-1}$ , and

$\bar{p}_a < \frac{1}{3} 10^{-31} \text{ gm} \cdot \text{cm}^{-3}$ . Assuming that the density of matter in the solar system is  $\bar{\rho} \sim 10^{-24} \text{ gm} \cdot \text{cm}^{-3}$ , one obtains

$\frac{\bar{p}_a}{\bar{\rho}} < \frac{1}{3} 10^{-7}$ . There are 2 references: 1 Soviet-bloc and 1  
Card 3/4

37198  
S/560/61/000/011/004/012  
EO32/E514

3.2410  
3.2100

AUTHORS:

Savenko, I.A., Nesterov, V.Ye., Pavrin, P.I. and  
Pisarenko, N.F.

TITLE:

The cosmic-ray equator according to the data  
obtained with the third Soviet spaceship

SOURCE:

Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli.  
no.11, Moscow, 1961. Rezul'taty nauchnykh  
issledovaniy, provedennykh vo vremya poletov vtorogo  
i tret'yego kosmicheskikh korabley-sputnikov, 30-34

TEXT:

It is pointed out that the use of satellites in  
determination of the cosmic-ray equator, i.e. the geographical  
position of the line of minimum intensity of primary cosmic rays,  
has many advantages over terrestrial measurements. In a previous  
paper the authors reported the determination of 22 points on this  
equator with the aid of the second cosmic Soviet spaceship (in  
only 20 hours). The apparatus mounted on the third spaceship  
included a gas-discharge halogen CTC-5 (STS-5) counter and a  
scintillation counter (NaI:Tl). The counters were placed inside  
the spaceship and were surrounded by a screen of between 5 and  
Card (1/4)

The cosmic-ray equator ...

S/560/61/000/011/004/012  
EO32/E514

150 g cm<sup>-2</sup>, as described by S. F. Papkov et al. (Ref.2: Iskusstvennyye sputniki Zemli, No.9, Izd-vo AN SSSR, 1961, p.78). Pulses from the counters were fed into scaling circuits which were sampled at intervals of 3 min by a memory device with a capacity of 24 hours. In this way it was possible to measure the latitude dependence of the intensity of cosmic radiation for each transit across the equator. It is noted that the cosmic-ray intensity measured by the STS-5 counter in the polar regions and at the equator (3 particles cm<sup>-2</sup> sec<sup>-1</sup> and 0.7 particles cm<sup>-2</sup> sec<sup>-1</sup>, respectively) is in excess of the published values for this intensity (Ref.3: A.N.Charakhch'yan and T.N.Charakhch'yan, ZhETF, 55, 1088, 1958). An analogous effect was observed from the second cosmic spaceship. The discrepancy may be due (among other things) to secondary radiation produced in the envelope of the spaceship. Fig.5 shows the position of the cosmic-ray equator obtained by averaging the data obtained with the second and third spaceships. It follows from this figure that the cosmic-ray equator at altitudes of 200 to 300 km is in satisfactory agreement with the equator computed by J.J.Quenby and W.R. Webber (Ref.7: Philos.Mag., 4, 90, 1959) and the octupole-approximation calculations of

Card 2/4

The cosmic-ray equator ...

S/560/61/000/011/004/012  
E032/E514

P.J.Kellogg and M. Schwartz (Ref.8: Nuovo cimento, 13,761,1959).  
There are 5 figures.

SUBMITTED: June 27, 1961

Fig.5.Legend

- 1 - Average results for the second spaceship (Geiger counter) and the third spaceship (Geiger and scintillation counters),
- 2 - Experimental results at sea level as reported in the literature,
- 3 - experimental aeroplane measurements as reported in the literature,
- 4 - equator computed on the basis of the dipole approximation of the geomagnetic field,
- 5 - Quenby and Webber's calculations (Ref.7),
- 6 - Kellogg and Schwartz's calculations (Ref.8),
- 7 - zero-inclination equator for the spoch 1955.

Card 3/4

SAVENKO, I.A.; NESTEROV, V.Ye.; SHAVRIN, P.I.; PISARENKO, N.F.

The equator of cosmic rays according to the data of the third  
Soviet satellite vehicle. Geomag. i aer. 1 no.4:490-493 J1-Ag  
'61. (MIRA 14:12)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,  
Institut yadernoy fiziki.

(Cosmic rays)

34351  
S/203/61/001/006/003/021  
D055/D113

3.2420 (1049,1482)

AUTHORS: Savenko, I.A.; Shavrin, P.I.; Pisarenko, N.F.

TITLE: Detection of soft corpuscular radiation at 320 km altitude in the near-equatorial latitudes

PERIODICAL: Geomagnetizm i aeronomiya, vol 1, no 6, 1961, 875-879

TEXT: The existence of soft corpuscular radiation at a height of 320 km in the near-equatorial latitudes between 150°E and 150°W is discussed. According to the authors, this radiation caused certain discrepancies in the readings of two detectors installed on the second Soviet spaceship. The first(external) detector, an ~~45Y~~ -15 (FEU-15) photomultiplier, could register x- and  $\gamma$ - rays, protons of 1 Mev energy and electrons of > 30 kev energy. The second (internal) detector, a scintillation counter, registered the  $\gamma$ -quanta of the bremsstrahlung with a counting threshold of 25 kev. The comparison of the two registration curves showed that, when the spaceship crossed the radiation belts, and the near-equatorial regions maxima and minima in the second part of both curves coincided. In the first part,

Card 1/3

S/203/61/001/006/003/021  
D055/D113

Detection of ...

T.V. Kurakina are mentioned. There are 4 figures and 8 references: 6 Soviet and 2 non-Soviet references. The two English-language references are: T. Obayashi. J. Geomagn. and Geoelectr., 1958, 10, 28; R. Smith. J. Geophys. Res., 1960, 65, 2583.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.  
Institut yadernoy fiziki. (Moscow State University im.  
M.V. Lomonosov. Institute of Nuclear Physics)

SUBMITTED: September 16, 1961.

Card 3/3

The use of electrostatic ...

S/203/61/001/006/016/021  
D055/D113

important application in space radio communication, radio astronomy and radio navigation. Between 1959 and 1961, several different electrostatic analyzers were developed at the Institut yadernoy fiziki (Institute of Nuclear Physics). They have the following advantages: a differential energy spectrum of particles can be obtained; light intensity can be made much greater than in a magnetic analyzer of comparable size; if an open electron multiplier is used as a detector, very small flows of 1 particle/cm<sup>2</sup> sec·sterad with energies of 10<sup>2</sup> ev and higher can be detected; the analyzer's electronic and optical properties do not depend on the particle's mass. There are 8 figures and 6 references, 4 Soviet and 2 non-Soviet. The English-language references are: F.T. Rogers. Rev. Sci. Instr., 1951, 22, 723-726; M. Walt, L.F. Chase, J.B. Cladis, W.L. Imhof. Proc. First Intern. Space Science Symposium, Nice, 1960, no. 11-16, 910. X

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.  
Institut yadernoy fiziki (Moscow State University imeni  
M.V. Lomonosov. Institute of Nuclear Physics).

SUBMITTED: October 17, 1961.

Card 2/2



30:96  
S/057/61/031/011/013/019  
B125/B102

The magnetic-field...

the magnetic system of an accelerator with spiral sectors. This device had the parameters  $k = 9$ ,  $H_{\min} = 11$  oe,  $H_{\max} = 300$  oe,  $R_{\min} = 45$  cm,  $R_{\max} = 65$  cm,  $\beta = 65^\circ$ ,  $C = 2$ ,  $N = 10$ ,  $\theta_B = 45^\circ$ ,  $\theta_p = 140^\circ$ . Fig. 1 shows shape and dimensions of a sector. Magnetic measurements were made by a method based on the galvanomagnetic Hall effect. An n-type Ge crystal served as pickup for the Hall electromotive force. Fig. 4 shows the experimentally found azimuthal distribution of the field for a fixed value of the radius and also the sinusoidal line of the period  $\theta_p + \theta_b$  which is equal to the period of the magnetic system. For  $R = \text{const}$ , the azimuthal distribution can be represented as  $H(\theta) = H(\theta_0) \left( 1 + A \sin \frac{2\pi\theta}{\theta_p + \theta_b} \right)$ .

According to these experimental data, the amplitude

$A = \frac{H(\theta)_{\max} - H(\theta)_{\min}}{H(\theta)_{\max} + H(\theta)_{\min}}$  was equal to 0.2. Further experimental results are given by Figs. 5 - 8. The compensating field consists of the fields from the compensating coils wound on the lateral surfaces of the two

Card 2/64

X

28765 S/056/61/041/003/018/020  
3113/3102

3 9110 (1121, 1482)

AUTHORS: Savenko, I. A., Shavrin, P. I., Nesterov, V. Ye., Pisarenko, N. F.

TITLE: Equator of cosmic rays according to data of the second Soviet spaceship

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 3(9), 1961, 985 - 986

TEXT: The use of earth satellites for determining the equator of cosmic rays from which the structure of the geomagnetic field can be determined and which permits the checking of the correctness of the theoretical and empirical approximation of this field offers a series of advantages over the measurements made on the earth. Thus, the equator of cosmic rays and especially its effect on the geophysical phenomena can be accurately studied. The second spaceship also contained a gas-discharge counter whose pulses were fed to a rate meter which was automatically interrogated by a diurnal storage system every third minute. Upon command from the earth the information stored by this system was transmitted to the

Card 1/2

29008

S/020/61/140/004/008/023  
B104/B108

3.2420 (1049,1482)

AUTHORS: Vernov, S. N., Corresponding Member of the AS USSR, Savenko,  
I. A., Shavrin, P. I., Nesterov, V. Ye., and Pisarenko, N. F.

TITLE: Outer radiation belt of the Earth at 320 km altitude

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 4, 1961, 787 - 790

TEXT: The second Soviet satellite whose orbit was at an altitude of 307 - 339 km had an automatic storage system which enabled it to measure continuously the radiation intensity in latitudes of  $\pm 65^\circ$ . The scintillation counter consisted of a  $\Phi\text{ЭУ}-16$  (FEU-16) photomultiplier and a NaI(Tl) crystal. The energy threshold of this counter was 25 kev. An CTC-5 (STS-5) Geiger counter was also used. Measurements showed that the counting rate of the scintillation counter, from the equator to latitudes of  $\pm 40 - 50^\circ$ , increased from 3 - 5 pulses/cm<sup>2</sup>.sec to 10 - 12 pulses/cm<sup>2</sup>.sec. In latitudes from  $\pm 50^\circ$  to  $\pm 65^\circ$ , the counting rate increased to 20 - 600 pulses/cm<sup>2</sup>.sec in most cases. The authors assume that this increase in x-ray intensity is caused by particles of the radiation belt of the Earth. To prove this

Card 1/2

29111

S/020/61/140/005/006/022  
B125/B138

3.2420 (1049, 1482)

AUTHORS: Vernov, S. N., Corresponding Member AS USSR, Savenko, I. A.,  
Shavrin, P. I., Pisarenko, N. F.

TITLE: Discovery of an inner radiation belt at 320 km altitude in  
the region of the South-Atlantic magnetic anomaly

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 5, 1961, 1041-1044

TEXT: The paper reports on the discovery and investigation of the inner radiation belt by the second Soviet satellite. The radiometric apparatus (gas discharge counter TC-5(STS-5) and scintillation counter ФЭУ-16(FEU-16) with NaI(Tl) crystal) carried on the satellite recorded increased radiation intensity above the magnetic anomaly in the South Atlantic. The scintillation counter recorded particles with a threshold of 25 kev and the total release of energy in the crystal. Analysis of the data leads to the following conclusions: The increased radiation intensity revealed to the authors by the flights of the second Soviet satellite at 320 km altitude above the Brazilian magnetic anomaly is attributable to the inner radiation belt. Since no inner radiation belt has been found north of the geomagnetic equator, the reflection points there lie higher than in the anomalous  
Card 1/3

07/13/2001

29111

S/020/61/140/005/006/022  
B125/B138

Discovery of an inner radiation....

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. A. Lomonosova  
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 30, 1961

4

Card 3/3

PISARENKO, N. F., SAVENKO, I. A., CHUDAKOV, A. Ye., SHAVRIN, P. I.,  
VERNOV, S. N., GORCHAKOV, E. V., LOGACHEV, Yu. I., NESTEROV, V. E.,

"Investigations of Radiation During Flights of Satellites, Space  
Vehicles, and Rockets"

Soviet Papers Presented at Plenary Meetings of Committee on Space Research  
(COSPAR) and Third International Space Symposium, Washington, D. C.,  
23 Apr - 9 May 62

VERNOV, Sergey N., LOGACHEV, Yu. I., GORCHANOV, Ye. V., SAVENKO, I. A.  
CHUDAKOV, Alek Ye. and NESTEROV, V. Ye.

"The earth's radiation belt"

report to be submitted to the 13th Intl. Astronautical Congress, IAF,  
Varna, Bulgaria, 23-29 Sep 1962.

S/865/62/002/000/018/042  
D405/D301

Ionizing radiations ...

The geographic distribution and the magnitude of absorbed dose-rates were determined. These results were obtained by means of radiometric equipment consisting of scintillation and Geiger counters. This equipment enabled the determination of the nature of the radiation, to estimate the energy of the particles and to measure the absorbed dose-rate; by using memory devices with 24 hour storage capacity it was possible to conduct these measurements around the entire globe. The average absorbed dose-rate was 8.5 and 8.3 mrad/day for the Second and Third Space Ships respectively; the absorbed dose-rate inside the space ships varied between 0.35 and 0.7 mrad, depending on the position of the orbit with respect to the radiation belts. It was found that the proton fluxes of the internal contribution of the Brazilian anomaly may give a substantial contribution to the dose-rate. The average dose-rate of 8.5 and 8.3 mrad/day is not dangerous to astronauts. At 320 km the absorbed dose-rate was 4.0 mrad/day. The presence of primary cosmic radiation at high altitudes may lead to some specific, though rare, biological effects which are not observed at sea level. In the case of flights of not very long duration at altitudes of 200-300 km, only solar cosmic

Card 2/3



Ionizing radiations ...

S/865/62/002/000/018/042  
D405/D301

radiation, produced in chromospheric bursts, can present a radiation hazard. Some data on cosmic-radiation bursts during 1958-1959 are listed. Systematic forecasts of solar bursts accompanied by the emission of cosmic radiation are very important for the prevention of exposure to radiation hazard. Such a method of forecasting could be the recording of gamma radiation on the space ship. If the theory of the origin of cosmic radiation, developed by V.P. Shabanskiy and A.B. Severnyy is true, then any appearance of cosmic radiation at the moment of solar bursts ought to be accompanied by the emission of gamma radiation. Summing up, the absorbed dose-rate is strongly dependent on the inclination of the orbit, the flight altitude and the thickness of the space ship's protection. There are 10 figures and 3 tables.

Card 3/3

32678  
S/026/62/000/002/002/004  
D036/D113

17.1400

AUTHORS: Savenko, I.A.; Pisarenko, N.F.; Shavrin, P.I.

TITLE: Space flights and the radiation hazard

PERIODICAL: Priroda, no. 2, 1962, 40-48

TEXT: This popular article deals with radiation hazards in space flights. The system of measuring radiation doses in rads, cosmic radiation at the Earth's surface and at low altitudes, the effect of solar radiation on primary cosmic radiation, the radiation belts of the Earth, radiation connected with solar flares and dosimetric measurements made on board the second and third Soviet satellites in August and December 1960 are discussed. The dosimetric measurements are shown in charts and a graph. The maximum permissible dose in the USSR for persons working continuously with radioactive materials and ionizing-radiation sources is 0.1 rems per working week. A group of scientists led by S.N. Vernov, Corresponding Member of the

Card 1/3

32676

S/026/62/000/002/002/004

D036/D113

Space flights and the radiation hazard

Other planets may also have radiation belts. Radiation resulting from solar flares is the main hazard. Solar flares producing a dose of 10 rad/hr behind a screen several  $g/cm^2$ -thick occur 3-7 times annually, more intense flares less often. For future flights, a special well-shielded cabin should be provided for protection during the flare, or else it should be possible to terminate the flight in good time. There are 8 figures and 3 references, 1 Soviet and 2 non-Soviet. The two English-language references are: "Journal of the Astronautical Science", 1961, No. 3; "Nucleonics", 1961, No. 4 (USA).

Card 3/3

42155

S/203/62/002/001/003/019  
I023/I223

3.2100 (460 3002)

AUTHORS: Vernov, S.N., Savenko, I.A., Shavrin, P.I., Nesterov, V.Ye.  
and Pisarenko, N.F.

TITLE: Earth's radiation belts at 180-250km height

PERIODICAL: Geomagnetizm i Aeronomiya, v.2, no.1, 1962, 41-47

TEXT: The distribution of cosmic rays and radiation belts at the height of 307-339km were obtained by the second Soviet cosmic satellite. The third cosmic space-ship, launched on December 1, 1960 with a perigee of 180km, apogee of 250km and an inclination of 65° measured the intensity and geographical position of the radiation belts in the height range 180-250km. The apparatus consisted of a NaI(Tl) crystal (a cylinder of 14mm height and 30mm diameter) with a photomultiplier and a gas counter. The crystal counted all particles above 25kev and measured the total energy dissipation in it. The counting rates increase from the equator to higher latitudes: of the counter from 0.8 to 3.2  $\frac{\text{counts}}{\text{cm}^2 \cdot \text{sec}}$ .

Card 1/3

S/203/62/002/001/003/019  
I023/I223

Earth's radiation belts...

of the photomultiplier from 3 to 12  $\frac{\text{counts}}{\text{cm}^2 \cdot \text{sec}}$ , and the energy dis-  
sipation increased from  $7.5 \times 10^6$  to  $3.7 \times 10^7 \frac{\text{ev}}{\text{cm}^2 \cdot \text{sec}}$ . When passing  
radiation belts the counting rate increased considerably. Graphs  
based on data from space-ship 2 and 3 are given. The geographical  
distribution of the radiation intensity as measured by the  
scintillation counter is also presented in a graphical form. The  
radiation intensity in the outer belt as measured by space-ship 2  
is on the average 2.2 times higher in the southern hemisphere  
(average height 330km) than in the northern (average height 320km).  
The same ratio as measured by space-ship 3 is 4.4 (average height  
in southern hemisphere - 235km, in the northern - 185km). There  
were variations in the geographical distribution of the belts  
between the two flights. The proton flux decreased between the  
two flights. There are 6 figures and 2 tables.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V.

Card 2/3

S/203/62/002/001/003/019  
I023/I223

Earth's radiation belts...

Lomonosova, Institut yadernoy fiziki (Moscow State  
University im. M.V. Lomonosov, Institute of Nuclear  
Physics)

SUBMITTED: August 28, 1961

Card 3/3

A study of the multiple scattering... S/120/62/000/006/005/029  
E032/E114

(G. Moliere, Z. Naturforsch. a, 3a, 1948, 78) using a carbon atom potential computed by the Hartree-Fock method. A more detailed account of the results is reported elsewhere by the present authors (Zh. eksperim. i teor. fiz., v.42, no.3, 1962, 740). There are 7 figures. ✓

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki MGU (Scientific Research Institute of Nuclear Physics, MGU)

SUBMITTED: January 26, 1962)

Card 2/3

S/560/62/000/013/002/009  
I046/I242

Radiation belts of the earth...

Comparison with the findings of the second orbital spaceship shows that in the high radiation-intensity region in the Southern Atlantic the bremsstrahlung intensity has increased with the 100 km decrease in altitude and the entire region appears to have shifted to the north-west. This anomalous behavior may be due to either the magnetic storm of November 30 and December 1, 1960, or to some new phenomenon on the inner boundary of the radiation belts. The average bremsstrahlung energy for the outer-belt electrons is  $E_e \approx 2 \cdot 10^5$  eV; the corresponding electron flux is  $2 \cdot 10^5$  particles  $\text{cm}^{-2} \text{sec}^{-1}$ . The radiation over the Brazilian magnetic anomaly is due to the protons of the inner radiation belt; the particle count in this region (Geiger counters) drops from 10 particles  $\cdot \text{cm}^{-2} \cdot \text{sec}^{-1}$  at  $h=320$  km (orbital ship II) to 2 particles  $\cdot \text{cm}^{-2} \cdot \text{sec}^{-1}$  at  $h=220$  km (orbital ship III). There are 6 figures and 2 tables.

SUBMITTED: September 12, 1961  
Card 2/2



S/560/62/000/013/003/009  
I046/I242

Soft corpuscular radiation at...

of about  $5 \text{ g.cm}^{-2}$ . The observed properties of the corpuscular radiation can be envisioned as  $10^4 \text{ eV}$  electrons moving in a stream of  $5 \cdot 10^9 \text{ particles.cm}^{-2}.\text{sec}^{-1}.\text{ster}$ . The origin of the low-energy charged particles in these regions is still unknown. There are 5 figures.

SUBMITTED: September 12, 1961

Card 2/2

S/560/62/000/013/004/009  
I046/I242

Measurement of the...

results, combined with the data produced by the second orbital ship for altitudes of 306 to 339 km, show that space flight is virtually safe at altitudes below 350 km, when there are no solar chromospheric flares. There are 2 figures. ✓

SUBMITTED: October 10, 1961

Card 2/2

Radiation studies during the flights ...

S/O48/62/026/006/013/020  
B125/B102

boundaries of this belt were determined more accurately by the lower orbiting Soviet spaceship. At 16 hours after the chromosphere flare of June 17, 1958 had vanished but still a few hours before the magnetic storm, charged particle intensity increased. The electron spectrum of the outer radiation belt does not change much at an altitude of 32,000-40,000 km, nor did the magnetic storm which occurred during the flight of the third Soviet spaceship have any substantial effect on the outer radiation belt. Except for a few percent, the proton intensity of the inner radiation belt remained constant during the three weeks' flight of the third Soviet satellite. The increased radiation intensity over the Brazilian anomaly, observed on board of the second spaceship at an altitude of 320 km, was due to the inner radiation belt. In this anomaly, the proton component of the inner radiation belt is predominant at small geomagnetic latitudes. The portion of X-rays increases with increasing latitude. A zone of lower bremsstrahlung intensity separates the outer from the inner radiation belt. This zone is practically absent in the region of the Brazilian anomaly. The equator of cosmic rays determined by the second and the third Soviet spaceship resembles remotely a sine curve running between 11° of northern and 11° of southern latitude.

Card 2/3

S/056/062/042/003/016/049  
B104/B102

AUTHORS: Bednyakov, A. A., Boyarkina, A. N., Savenko, I. A.,  
Tulinov, A. F.

TITLE: Investigation of multiple scattering of 100 - 200 kev  
protons from carbon.

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,  
no. 3, 1962, 740 - 746

TEXT: The angular distributions of 100 - 200 kev protons multiply  
scattered from polystyrene films were determined by a photographic method.  
The measurements were made on the electrostatic accelerator of the NIIYaF  
MGU. The photographic plates were placed at a distance of about 30 mm  
from the polystyrene films which were hit by a perpendicular proton beam.  
The hydrogen contained in polystyrene contributed only little to proton  
scattering. The targets had the following thicknesses:  $24 \pm 0.6$ ,  
 $40 \pm 0.7$ ,  $69 \pm 0.9$ ,  $88 \pm 1.1$ , and  $104 \pm 1.2 \mu\text{g}/\text{cm}^2$ . Calculations were con-  
ducted on the basis of Molière's theory. A difference of 20 - 30% was ob-  
served between experimental and calculated scattering. This discrepancy  
is a consequence of the Thomas-Fermi model used in the theory. If the  
Card 1/2

SAVENKO, I. A., VOLYNKIN, Yu. M., SAKSONOV, V. V., and ANTIPOV, V. V.,

"Problems of Radiation Safety of Space Flights,"

report submitted for the 14th Intl. Astronautical Federation (IAF) Congress,  
Bioastronautics Committee, Paris, France 25 Sep-1 Oct 63

SAVENKO, I. A.; PISARENKO, M. F.; SHAVRIN, P. I.; NESTEROV, V. Ye.;

"Controlling a level of cosmic radiation during the flights of the "Vostok-3", "VOSTOK-4", "VOSTOK-5" and "VOSTOK-6" space ships. (USSR)

Report submitted for the COSPAR Fifth International Space Science Symposium, Florence, Italy, 8-20 May 1964.

SAVENKO, I. A.; SAVUN, O. I.; SHAVRIN, P. I.; SHARVINA, K. N.; VERNOV, S. N.;  
NESTEROV, V. Ye.; PISARENKO, N. F.;

" A Study of the Earth's radiation belts in the region of the Brazilian magnetic anomaly at altitudes of 235 to 345 kms. (USSR)."

Report submitted for the COSPAR Fifth International Space Science Symposium, Florence, Italy, 8-20 May 1964.

SAVENKO, I. A.; TVERSKAYA, L. V.; TVERSKOY, B. A.; SHAVRIN, P. I.; VERNOV, S. N.;

"About the fast electron intensity asymmetry in conjugated points at low altitudes," (USSR).

Report submitted for the COSPAR Fifth International Space Science Symposium, Florence, Italy, 8-20 May 1964.



SAVENKO, I.A.; SHAVRIN, P.I.; NESTEROV, V.Ye.; PISARENKO, N.F.;  
TEL'TSOV, M.V.

Cosmic radiation on the eve of the flight of the spaceships  
"Vostok-3" and "Vostok-4." Kosm. issl. 1 no.1:172-175  
J1-Ag '63. (MIRA 17:4)

SAVENKO, I.A.; PISARENKO, N.F.; SHAVRIN, P.I.; NESTEROV, V.Ye.

Radiation check during the flight of the spaceships "Vostok-3"  
and "Vostok-4." Kosm. issl. 1 no.1:176-178 J1-Ag '63.  
(MIRA 17:4)

ANTIPOV, V.V.; YEFREMOV, Yu.I.; NIKITIN, M.D.; SAVENKO, I.A.; SAKSONOV, P.P.

Safety measures against radiation during flights of the spaceships  
"Vostok-3" and "Vostok-4". Kosm. issl. 1 no.2:303-308 S-0  
'63. (MIRA 17:4)

GRIGOROV, N.L.; ZHURAVLEV, D.A.; KONDRAT'YEVA, M.A.; RAPOPORT, I.D.;  
SAVENKO, I.A.

Study of cosmic radiation outside the atmosphere. Kosm. issl.  
1 no.3:436-442 N-D '63. (MIRA 17:4)

VERNOV, S.N.; SAVENKO, I.A.; SHAVRIN, P.I.; TVERSKAYA, L.V.

Structure of the earth's radiation belts at an altitude of  
320 km. Geomag. i aer. 3 no.5:812-815 S-0 '63. (MIRA 16:11)

Institut yadernoy fiziki Moskovskogo gosudarstvennogo universi-  
teta.

L 14277-63 EWT(1)/FCC(w)/FS(v)/EDS/EEG-2/ES(v) AFFTC/ASD/AFMOC/APGC/  
ESD-3 Fe-4/Pi-4/Fq-4 TT/GW/JFW  
ACCESSION NR: AP3005304 S/0056/63/045/002/0394/0394

AUTHOR: Grigorov, N. L.; Zhuravlev, D. A.; Kondrat'yeva, M. A.; Rapoport, I. D.;  
Savenko, I. A.

84  
83

TITLE: Search for antimatter<sup>?</sup> in cosmic rays<sup>19</sup>

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 394

TOPIC TAGS: cosmic-ray antimatter, cosmic ray, antimatter, spaceflight

ABSTRACT: On 19 Aug 1960 the Second Ship-Satellite [the "Strelka"-"Belka" flight] was sent into space carrying an emulsion stock of 489 layers of type-BR emulsion 400  $\mu$  in total thickness. The open emulsion stock was kept for approximately 24 hr at an altitude of 300 km and later examined with a 105X microscope for the purpose of detecting multiply-charged nuclei stopped by the emulsion and "stars" produced by the nuclei. The emulsion stock was found to have 1079 stopped nuclei of atomic number  $Z > 2$  and 748 "stars", which could not be attributed to the annihilation of stopped antinuclei. It is concluded that the number of antinuclei with  $Z > 2$  in the primary cosmic rays does not exceed 0.1%, at least for the case of low-energy antinuclei.

ASSOCIATION: Institute of Nuclear Physics of Moscow State University.  
Card 1/2

SAVENKO, I. A.; PISARENKO, N. F.; SHAVRIN, P. I. and NESTEROV, V. E. (Acad. Sci. USSR)

"Controlling the Level of Cosmic Radiation during the Flights of the VOSTOK-3, VOSTOK-4, VOSTOK-5, and VOSTOK-6 Spaceships"

Report presented at the COSPAR, 5th Intl Space Science Symposium, Florence, Italy, 8-20 May 1964

SAVENKO, I. A., SHAVRIN, P. I., NESTEROV, V. E., PISARENKO, N. F., BASILOVA, R. N.,  
and VERNOV, S. N. (Acad. Sci. USSR)

"A Study of Cosmic Rays at Altitudes of 200 to 400 Km"

Report presented at the COSPAR, 5th Intl Space Science Symposium, Florence,  
Italy, 8-20 May 1964



VERNOV, S.M.; CHUDAKOV, A.Ye.; GORCHAKOV, Ye.V.; LOGACHEV, Yu.I.; NESTEROV,  
V.Ye.; SAVENKO, I.A.; SHAVRIN, P.I.

Radiation belts of the earth. Geofiz. biul. no.14:96-108 '64.  
(MIRA 18:4)

ACCESSION NR: AP4026241 . s/0293/64/002/001/0147/0149

AUTHOR: Savenko, I. A.; Pisarenko, N. F.; Shavrin, P. I.; Nesterov, V. Ye.

TITLE: Measurement of total radiation dose aboard Vostok-5 and Vostok-6

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 1, 1964, 147-149

TOPIC TAGS: radiation monitoring, radiation dosimetry, onboard dosimeter, absorbed dose, RBE dose, Vostok-5, Vostok-6

ABSTRACT: Data from onboard radiation meters (gas-discharge type) indicate that the total absorbed radiation dose was 50 mrad for By\*kovskiy (Vostok-5, 119-hr flight) and 30 mrad for Tereshkova (Vostok-6, 71-hr flight). Flight data for the two spaceships were as follows:

	Vostok-5	Vostok-6
Orbit time	88.27 min	88.3 min
Apogee	222 km	231 km
Perigee	175 km	181 km

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ACCESSION NR: AP4026241

Primary cosmic radiation, radiation belt particles, and cosmic rays originating with solar chromospheric flares were the types of hard radiation monitored. Helio-magnetic and geomagnetic conditions were comparatively quiet during the period of the flights; a few flares not exceeding 2 points on the scale in intensity occurred, but were not accompanied by any significant corpuscular streams in the space near the Earth. Fig. 1 of Enclosure shows radiation data during a 70-hr segment of the flights. Although the dose rate on Vostok-3 and Vostok-4 was higher on orbits passing through the Brazilian and South Atlantic anomalies than for other orbits, the dose registered on Vostok-5 and Vostok-6 was linearly dependent on the time of flight for all orbits, indicating that radiation belts added little to the total dose during the latter flights. Values for both Vostok-5 and Vostok-6 fall in a single straight line, indicating a measured dose rate of 8 mrad per diem, or 0.33 mrad/hr. Comparison with the dose rate measured for Vostok-3 and Vostok-4 (14 mrad per diem) in August 1962 shows a decrease in radiation intensity at altitudes in the neighborhood of 200 km. This is most likely due to decay (at least at lower altitudes) of the artificial radiation belt created by upper atmosphere nuclear tests in 1962. Orig. art. has: 1 figure.

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ACCESSION NR: AP4026241

ASSOCIATION: none

SUBMITTED: 10Sep63

DATE ACQ: 16Apr64

ENCL: 01

SUB CODE: AM

NO REF SOV: 004

OTHER: 000

Card 3/4

ACCESSION NR: AP4026242

S/0293/64/002/001/0150/0153

AUTHOR: Savenko, I. A.; Shavrin, P. I.; Pisarenko, N. F.; Nesterov, V. Ye.; Tel'tsov, M. V.; Yerofeyeva, V. N.

TITLE: Measurement of soft radiation in the equatorial latitudes from the "Cosmos-4" satellite

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 1, 1964, 150-153

TOPIC TAGS: radiation measurement, radiation belt, cosmic ray equator, sputnik, satellite radiation measurement, Cosmos-4, soft radiation, count rate, energy release, corpuscular radiation

ABSTRACT: The second Soviet sputnik (19-20 August 1960) carried a scintillometer for recording intense, sporadic streams of corpuscular radiation in equatorial latitudes. Since this detector was designed to measure total flux energy of the particles and energy release within the crystal, the number of impulses was not directly recorded, and particle flux had to be determined from energy release in the scintillometer on the basis of various assumptions as to the nature of the particles involved and their average energy. To check conclusions

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drawn from the data obtained by the 1960 satellite, Cosmos-4, launched 26 April 1962, carried an external scintillometer capable of measuring not only total energy release, but also the counting rate of particles with energies greater than 100 kev. Table 1 of Enclosure gives the counting rate  $N$  (particle/cm<sup>2</sup>/sec), the energy release  $E$  (Mev/cm<sup>2</sup>/sec), and the ratio  $E/N$  (kev), representing the average energy release per single registered particle. Values in the table are averaged over the flight segment falling within 10° of the cosmic ray equator for 13 crossings of the equator. As can be seen, the  $E/N$  values are of the order of 100 kev. However, if  $E/N$  actually represents readings caused by the simultaneous striking of the counter by two or more electrons with subthreshold (<100 kev) energies, then the count obtained may actually reflect a flux of  $10^4$ /cm<sup>2</sup>/sec with energies of  $6 \times 10^4$  ev, a flux of  $10^5$ /cm<sup>2</sup>/sec with energies of  $3 \times 10^4$  ev, or a flux of  $10^3$ /cm<sup>2</sup>/sec with energies of  $1 \times 10^4$  ev. Since large fluxes with energies of 10 kev were not observed stationarily, the energy of the recorded electrons must exceed  $3 \times 10^4$  ev. The occurrence of such electrons may possibly be related to seepage from radiation belts or electrical processes in the ionosphere. The results confirm the presence, apparently constant, of low-intensity ( $10^2$  to  $10^5$  particle/cm<sup>2</sup>/sec/steradian) electron streams with energies greater than

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ACCESSION NR: AP4026242

30 kev at an altitude of 300 km over the equatorial zone. No regular dependence of intensity and average energy on time was observed. Orig. art. has: 1 table and 1 figure.

ASSOCIATION: none

SUBMITTED: 20Sep63

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ENCL: 01

SUB CODE: AS

NO REF SOV: 009

OTHER: 000

Card 3/4

ACCESSION NR: AP4026240

S/0293/64/002/001/0136/0146

AUTHOR: Vernov, S. N.; Savenko, I. A.; Shavrin, P. I.; Nesterov, V. Ye.;  
Pisarenko, N. F.; Tel'tsov, M. V.; Pervaya, T. I.; Yerofeyeva, V. N.

TITLE: Some results of radiometric measurements at heights of 200—400 km during  
1960-1963

SOURCE: Kosmicheskiye Issledovaniya, v. 2, no. 1, 1964, 136-146

TOPIC TAGS: artificial satellite, radiation dose, radiation belt, cosmic radiation,  
cosmic ray, solar activity cycle, artificial radiation belt, space flight,  
astronaut

ABSTRACT: Measurements made by 15 satellites and spaceships (the second and third  
spaceships, satellites of the "Cosmos" series, and "Vostok" spaceships) during the  
period from August 1960 through June 1963 at heights of 175-405 km were used to  
determine the daily values of the radiation dose for various flight trajectories;  
these doses were 10-55 mrad/day and are not dangerous for astronauts when the  
shielding of the ship is denser than 3-5 g/cm<sup>2</sup>. At the time of measurements in  
April 1962 and June 1963 it was found that there was an increase by a factor of 1.2  
in the intensity of cosmic radiation in the high latitudes where the magnetic rigi-  
dity does not exceed 5.4 Bev. There was no increase of intensity in the equatorial

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latitudes (magnetic rigidity greater than 5.4 Bev). These facts confirm the assumption of a genetic relationship between excess cosmic radiation recorded at heights of 200-400 km and primary cosmic radiation. Using mirror points at heights of about 350-370 km, it was possible to determine the lifetime of the particles of the artificial radiation belt as approximately 3 months. For orbits of 210-369 km the dose caused by the artificial radiation belt 20 days after its formation was almost 3 times as large as the dose caused by cosmic radiation in the natural belts. The dependence of the mean daily intensity caused by the radiation belts on height was determined. In an orbit of 207-407 km this intensity was 5.6 times as large as in an orbit of 209-301 km. The contribution to the dose by the radiation belts for satellites with an apogee of 400 km becomes equal to the dose caused by cosmic radiation. A table in the original article lists the characteristics of the radio-metric apparatus carried aboard the "Cosmos" satellites; another table lists the 15 satellites and spaceships and the absorbed dose measured by each. "The authors express thanks to S. F. Papkov, Yu. V. Trigubov, O. I. Savun, A. F. Tupikin, and L. A. Smirnov for participation in developing the apparatus and making the experiments and to Prof. N. L. Gridorov for participation in discussion of the results." Orig. art. has: 2 figures, 2 tables, and 9 formulas.

ASSOCIATION: none

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ACCESSION NR: AP4026240

SUBMITTED: 29Ju163

SUB CODE: AA

ATD PRESS: 3053

.NO REF SOV: 011

ENCL: 00

OTHER: 002

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S/0293/64/002/002/0280/0288

ACCESSION NR: AP4034800

AUTHOR: Basilova, R. N.; Vernon, S. N.; Nesterov, V. Ye.; Pisarenko, N. F.;  
Savenko, I. A.; Shavrin, P. I.

TITLE: Investigation of cosmic radiation at heights of 200-350 km by the satellites  
"Kosmos 4" and "Kosmos 7"

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 2, 1964, 280-288

TOPIC TAGS: artificial satellite, cosmic radiation, cosmic ray equator, cosmic  
rays, radiation counter, inner radiation belt, radiation belt

ABSTRACT: As the result of an analysis of the counting rate of STS-5 counters  
carried aboard the satellites "Kosmos 4" and "Kosmos 7", it was possible to find 13  
additional points on the cosmic ray equator. A study of the geographic distribu-  
tion of the counting rate of the STS-5 counters also made it possible to discover a  
relationship between the radiation registered by these counters and primary cosmic  
rays. The regular longitude variation of the STS-5 counting rates in the neighbor-  
hood of the equator, the relationship of the counting rate to the magnetic rigidity  
cutoff of the point of measurement and the reasonable latitude variation are all  
properties of the radiation registered by these counters which can be related to

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ACCESSION NR: AP4034800

primary cosmic rays. It would be difficult to explain these facts by assuming that the registered particles had diffused from the inner radiation belt. Fig. 1 of the Enclosure shows the geographic position of the points of minimum radiation registered by the counters. "The authors wish to thank Ye. A. Voronina, L. V. Drozdova and N. M. Trishkina for computation and drafting work". Orig. art. has: 5 formulas, 5 figures and 2 tables.

ASSOCIATION: None

SUBMITTED: 19Nov63

SUB CODE: AA, SV

DATE ACQ: 20May64

NO REF SOV: 005

ENCL: 01

OTHER: 006

Card 2/3

ACCESSION NR: AP4034801

8/0293/64/002/002/0289/0295

AUTHOR: Vernov, S. N.; Yerofeyeva, V. N.; Nesterov, V. Ye.; Savenko, I. A.; Shavrin, P. I.

TITLE: Geographic position of the maxima of particle intensity in the outer radiation belt at low heights

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 2, 1964, 289-295

TOPIC TAGS: upper atmosphere, radiation belt, outer radiation belt, aurora, radiation intensity maximum

ABSTRACT: As a result of investigations by the second and third Soviet space-ships, the position of the maxima of intensity of particles in the outer radiation belt has been established experimentally at all longitudes. The experimentally determined intensity maxima in the outer radiation belt are situated at different longitudes approximately along the drift paths of the mirror points. However, in two ranges of longitude (from  $-150$  to  $-110^\circ$  and from  $-50$  to  $-10^\circ$ ) in the northern hemisphere and in magnetically conjugate regions there is a displacement of the position of the intensity maxima in the direction of greater values L. In the first of the mentioned regions the position of the maxima of

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ACCESSION NR: AP4034801

frequency of occurrence of auroras also is displaced in the direction of larger L. As a result of investigations made on the satellite "Kosmos-4" it has been found that in a broad range of longitudes there is a displacement of the intensity maximum in the outer radiation belt on magnetically quiet days in the direction of greater latitudes than is the case on magnetically disturbed days. Fig. 1 of the Enclosure shows the geographic position of the maxima of intensity of particles in the outer radiation belt at low heights. The authors thank M. V. Tel'tsov and N. F. Pisarenko for participation in the experiment, L. V. Drozdova and O. F. Gorskaya for assistance in finalizing the data and V. Gess who furnished the maps of drift paths at various heights". Orig. art. has: 5 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 19Nov63

DATE ACQ: 20May64

ENCL: 02

SUB CODE: AA

NO REF SOV: 006

OTHER: 005

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ACCESSION NR: AP4034801

ENCLOSURE: 01

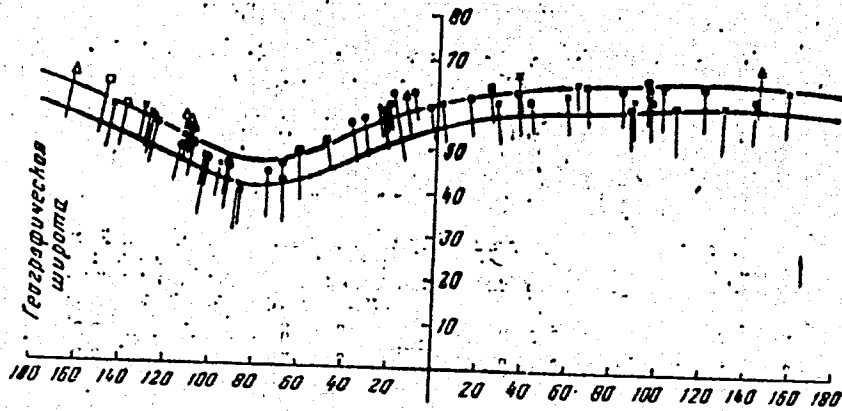


Fig. 1. Geographic position of the maxima of intensity of particles in the outer radiation belt at low heights. The filled circles and squares denote experimentally determined points of the maxima found from flights of the second and third

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ACCESSION NR: AP4034801

ENCLOSURE: 02

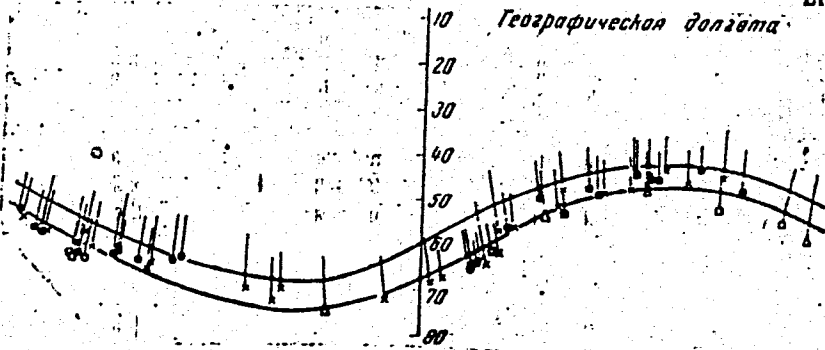


Fig. 1 (cont.) spaceships respectively; the crosses denote magnetically conjugate points for maxima measured on spaceships; the open squares denote experimentally determined points of the maxima obtained during the flight of the satellite "Kosmos-4"; the triangles denote magnetically conjugate points for maxima measured on the satellite "Kosmos-4"; the lines denote the drift paths of mirror points (at lesser latitudes for  $L = 3$  and at greater latitudes for  $L = 4$ ).

vertical: geographic latitude; horizontal: geographic longitude

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ACCESSION NR: AP4041571 S/0293/64/002/003/0485/0491

AUTHOR: Vernov, S. N.; Nesterov, V. Ye.; Savenko, I. A.; Shavrin, P. I.; Sharvina, K. N.

TITLE: Geographical intensity distribution of radiation in the region of Brazilian magnetic anomaly at the height of 300 km

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 3, 1964, 485-491

TOPIC TAGS: artificial satellite, geomagnetic anomaly, Geiger counter, oscillation counter, isoline, nuclear burst, artificial radiation belt, radiation intensity, inner belt

ABSTRACT: Data from Cosmos 4, Cosmos 7, and Cosmos 15, which passed through the region of the Brazilian geomagnetic anomaly at the heights of 235-340 Km, have been studied. Charged particles were counted by Geiger and oscillation counters. The results of processing are represented graphically by isolines, and the numerical values are given in a table. The numbers of the table show a difference between the two measurements. The data from Cosmos 4 were obtained before a nuclear burst in the atmosphere, and the data of Cosmos 15 were obtained

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ACCESSION NR: AP4041571

after the burst. The difference is created by an artificial radiation belt caused by the burst. The radiation of the artificial belt consists of electrons with energies of about 1-7 Mev, which have been recorded in the region of the Brazilian anomaly. The radiation intensity in the inner belt and in the artificial belt is approximately equal. Orig. art. has: 3 figures and 3 tables.

ASSOCIATION: none

SUBMITTED: 14Jan64

ATD PRESS: 3056

ENCL: 00

SUB CODE: AA

NO REF SOV: 004

OTHER: 002

Card 2/2

ACCESSION NR: AP4041572

S/0293/64/002/003/0492/0497

AUTHOR: Vernov, S. N.; Nesterov, V. Ye.; Pisarenko, N. F.; Savenko, I. A.; Savun, O. I.; Shavrin, P. I.; Sharvina, K. N.

TITLE: Investigation of terrestrial radiation belts in the region of the Brazilian magnetic anomaly at heights of 235 to 345 km

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 3, 1964, 492-497

TOPIC TAGS: magnetic anomaly, anomaly region, inner radiation belt, magnetic level, Geiger counter, electron lifetime, artificial radiation belt

ABSTRACT: A large region of high radiation intensity at the height of 300 km was detected by the second space probe at the Brazilian great negative geomagnetic anomaly. The intense radiation is caused by the sinking inner radiation belt at that height in the anomaly region; the intensity of the magnetic field at the height mentioned is less than 0.22 gs. The comparison of the counter speeds of Cosmos 4 with those of the second probe showed a more rapid decrease in the intensity of the magnetic field when the measurements were

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ACCESSION NR: AP4041572

carried out by Cosmos 4 at magnetic levels 1.2, 1.3, and 1.45. This comparison shows an increase of protons of the energy 25 Mev in the period between the launching of these space probes. Four times more particles were counted during the Cosmos-4 flight in 1962 than in 1960 during the flight of the second space probe. The lifetime of electrons in the artificial radiation belt is different for individual levels and the intensity of the magnetic field. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 14Jan64 /

ATD PRESS: 3064

ENCL: 00

SUB CODE: AA

NO REF SOV: 004

OTHER: 008

Card 2/2

L 6653-65 EWG(j)/EWT(1)/EWT(m)/EWG(v)/AR/K/FCC/EEC-4/EEC(t)/T/EWA(h)  
 Po-4/Pe-5/Pq-4/Pi-4/Pae-2/Pb-4 AFWL/SSD/AFMDC/BSA/AFETR/ESD(ga)/IJP(a)  
 ESD(t) GW/WS  
 ACCESSION NR: AP4046778 S/0293/64/002/005/0724/0762

86

AUTHOR: Grigorov, N. L.; Rapoport, I. D.; Savenko, I. A.; Skuridin, G. A.

TITLE: Some problems and possibilities in the field of cosmic ray research

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 5, 1964, 724-762

TOPIC TAGS: upper atmosphere, cosmic ray, ionization calorimeter, cosmic ray intensity, gamma radiation, photon, photoemulsion

ABSTRACT: In this lengthy paper, the authors discuss basic problems involved in the operation of an ionization calorimeter, an instrument for measuring the energy of cosmic ray particles and the dependence of the principal parameters of the ionization calorimeter on the conditions of its use. Also discussed are the possibilities of the use of the ionization calorimeter for the study of a number of the characteristics of interaction between atomic nuclei and cosmic ray particles with energies of  $10^{11}$ -- $10^{13}$  ev, for study of the composition of primary cosmic ray particles with high energies ( $10^{11}$ -- $10^{14}$  ev) and for the study of the electron component of primary cosmic rays and high-energy gamma radiation. In the introduction it is shown that presently used methods are completely unsuitable for solution of problems involved in the measurement of particle energies up to  $10^{15}$  ev. The ionization calorimeter, proposed by N. L. Grigorov, is regarded as the only pre-

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ACCESSION NR: AP4046778

sently available method for solving this problem; at least in the Soviet Union it has now become the basic tool in cosmic ray research at high-mountain stations. The ionization calorimeter is a flexible tool: with equal accuracy it makes it possible to measure the energy of charged and neutral particles and it can be combined with various other kinds of apparatus, such as Wilson chambers, spark chambers and even nuclear photoemulsions. This is the first detailed description of the ionization calorimeter in the literature. The article is divided into two chapters, each with a number of sections: 1. Ionization calorimeter: 1. Principle of operation. 2. Parameters of the ionization calorimeter. 3. Selection of material for the absorber. 4. Methods of recording ionization. 5. Role of nuclear spallations in energy losses and accuracy of measurement of the energy of a single particle. 6. Selection of ionization detectors. 7. Parameters of the ionization calorimeter for work in the upper part of the atmosphere and beyond its limits. 8. Recording of ionization bursts from a large number of detectors. II. Possible applications of the ionization calorimeter: 1. Study of the chemical composition of primary cosmic radiation in the region of high and superhigh particle energies. 2. Study of the characteristics of the nuclear interaction of high-energy primary cosmic particles. 3. Study of elementary nuclear processes by the photoemulsion method. 4. Study of high-energy electrons and photons in primary cosmic rays. The following are among the significant diagrams

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accompanying the text: Fig. 9 -- simple variant of the ionization calorimeter with scintillators for work in the upper part of the atmosphere; Fig. 10 -- apparatus for study of the processes of generation of  $J^0$ -mesons by cosmic ray particles with energies of  $10^{12}$ -- $10^{13}$  ev by the nuclear photoemulsion method; Fig. 11 -- instrument for registering high-energy electrons in primary cosmic rays; Fig. 12 -- instrument for study of the energy spectrum of primary  $\gamma$ -rays and search for local sources of  $\gamma$ -quanta. Orig. art. has: 85 formulas, 12 figures and 3 tables.

ASSOCIATION: none

SUBMITTED: 09Jun64

ENCL: 00

SUB CODE: AA, NP

NO REF SOV: 017

OTHER: 001

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L 11290-65 ENG(j)/EWI(d)/EWT(1)/EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EEC(k)-2/EPF(n)-2/  
EEC-4/EPR/EPA(w)-2/EWP(b)/EWA(h) Po-4/Pab-10/Pq-4/Pr-4/Pg-4/Ps-4/Pt-10/Peb/Pu-4/  
ACCESSION NRI: AP4043257 Pk-4/Pl-4 WM/GG/WH S/0203/64/004/004/0781/0784

AUTHOR: Antonova, I. A.; Pisarenko, N. F.; Savenko, I. A.; Shumshurov, V. I.

TITLE: High-sensitivity electrostatic relay

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 4, 1964, 781-784

TOPIC TAGS: weak current measurement, ionization chamber measurement, electrostatic relay, gold graphite contact, electrostatic relay, sensitive relay

ABSTRACT: A miniature high-sensitivity electrostatic relay designed for recording weak currents (up to  $10^{-15}$  amp) in automatic ionization chambers is described. It represents a system of normally open contacts, one of which is made from a gold-plated quartz fiber and another of which acts as a collector. The system is mounted on a high-quality amber insulator. The collector is directly connected to the internal electrode of an ionization chamber. The spot on the collector surface where the contact with the fiber takes place is coated with graphite. The distance between the fiber and collector can be adjusted by a

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ACCESSION NR: AP4043257

special regulator. Various materials for contacts were tried, but the most long-lived and stable in operation is the gold-graphite contact ( $10^6$  operations). Experiments show that the relay can be utilized for recording direct currents from  $10^{-7}$  to  $10^{-15}$  amp. The lower limit of the measured currents is determined by the quality of the insulating materials. The total current leakage does not exceed  $2 \cdot 10^{-16}$  amp. The electrostatic relay represents a system based on the attractive or repulsive action of an accumulated charge. Direct results of the measurements in the form of standard pulses can be obtained by using a reading (recording) device. The pulse repetition frequency is proportional to the magnitude of measured current. Orig. art. has: 2 figures.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universitet  
(Institute of Atomic Physics, Moscow State University)

SUBMITTED: 20Apr64

ATD PRESS: 3101

ENCL: 00

SUB CODE: EC,EM

NO REF SOV: 004

OTHER: 002

Card 2/2

GRICOROV, N.I.; SIBIRAVEV, D.A.; KUDRITSYNA, M.A.; RABOFORT, I.O.;  
SAVINKO, I.A.

Use of nuclear photoemissions in studying the nature of cosmic  
ray particles beyond the atmosphere. Tr. AN SSSR Ser. fiz. 28  
no.12:2035-2038 D 161 (MIRA 1982)

VERNOV, S.M.; SAVENKO, I.A.; SHAVRIN, P.I.; NESTEROV, V. Ya.; PISARENKO,  
N.P.; BASILOVA, R.M.

Study of cosmic rays at great altitudes. Izv. AN SSSR Ser. fiz.  
28 no.12:2045-2048 D 64 (MIRA 18:2)

L:20227-65 EWT(1)/EWG(v)/FCC/EEC-4/EEC(t)/EWA(h) Po-4/pe-5/pq-4/pae-2/peb/pi-4/  
Pb-4 AEDC(a)/SSD(c)/SSD/AFWL/ASD(a)-5/AS(mp)-2/ASD(p)-3/AFMD(c)/AFETR/ESD(gs)/  
ESD(si)/ESD(t) GN/WS  
ACCESSION NR: AP5002105 S/0048/64/028/012/2049/2057

AUTHOR: Vernov, S. N.; Savenko, I. A.; Shavrin, P. I.;  
Nesterov, V. Ye.; Pisarenko, N. F.; Sharvina, K. N.

TITLE: Data on the earth's radiation belts obtained during the Cosmos flights at altitudes of 200-400 km. [Report presented at the Vesesoyuzhoye soveshchaniye po fizike kosmicheskikh luchey (All-Union Conference on Cosmic Ray Physics), held at Moscow, 4-10 October 1963]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 28, no. 12, 1964, 2049-2057.

TOPIC TAGS: satellite, radiation density, electron density, solar activity, radiation belt, cosmic ray

ABSTRACT: Some data on the earth's radiation belts collected during the Cosmos series in 1960-1963 at altitudes below 400 km are presented. Data obtained from Cosmos-4 indicate a maximum density shift within the outer radiation belt over a broad interval of longitude during magnetically quiet days. At the same time, an increase of average density was also noted within the radiation belts. From data of

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