DORIN, V.A.; KUZNETSOV, B.I.; NASLEDOV, D.N.

Investigating the growth of a layer of an n-type semiconductor at a cadmium-selenium contact. Fiz.tver.tela 1 no.5:734-739 My '59. (MIRA 12:4)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR.
(Cadmium) (Selenium) (Semiconductors)

5(2) 05889

AUTHORS: Dorin, V. A., Tartakovskaya, F. M. SOV/78-4-11-42/50

TITLE: The Reduction of Titanium Dioxide in the Presence of Titanium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 11, pp 2635-2637 (USSR)

ABSTRACT: The reduction of TiO_2 has so far always been carried out by means of direct contact of the reagent with TiO_2. In the present paper, the authors report on the reduction of TiO_2 by means of Ti without contact between the two substances. Ti, in a quartz container, was submerged into the quartz test glass filled with TiO_2 so that the reduction could only take place by way of the gaseous phase. The behavior of the TiO_2-modifications rutile and anatase was investigated at temperatures up to 1100°(Tables 1,2). The color changes observed at rising temperature are caused by Ti^{3+}-ions. After heating for five hours, the rutile had the composition $TiO_{1.936}$. Traces of Ti_3O_5 appeared at 1050° .

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The Reduction of Titanium Dioxide in the Presence of Titanium

SOV/78-4-11-42/50

The anatase was transformed into rutile. The reduction of TiO_2 in the presence of Ti takes place within a wide temperature range. By corresponding variation in temperature and reaction time, dioxides with any deviation from the stoichiometric ratio can be obtained. Here, the TiO_2 becomes a semiconductor. The authors thank D. N. Nasledov for the attention paid to the paper. There are 2 tables and 5 references.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physical-technical Institute of the Academy of Sciences, USSR)

SUBMITTED: April 22, 1959

Card 2/2

68622

S/126/60/009/02/007/033
E111/E335

5.2200

AUTHORS: Dorin, V.A. and Filaretova, G.M.

TITLE: Investigation of the Growth of a Lead Sulphide Film on Lead in Contact with Liquid Sulphur

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 2, pp 195 - 201 (USSR)

ABSTRACT: The process of growth was studied in the range 175 to 300 °C by placing lead samples in liquid sulphur. X-ray analysis showed that the film formed consisted of one compound only with the composition of PbS. Figure 1 shows a micrograph of the sulphide film obtained at 200 °C. the thickness was measured by a comparator IZA-2. Figure 2 shows that there is a linear relationship between the thickness and time. The rate of growth has an exponential relationship with temperature (Figure 3). The effect of impurities in both the lead and sulphur was studied.. The films obtained on lead containing 1 at. % Sn, Cd or Zn were very thin. An addition of 1 at. % of Cu had no effect. Experiments in vacuo showed that the presence of air considerably

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S/126/60/009/02/007/033
E111/E335

Investigation of the Growth of a Lead Sulphide Film on Lead in Contact with Liquid Sulphur

increased the thickness of the film. It was shown that oxygen and not nitrogen was the cause of this increase. The presence of selenium or tellurium in the sulphur also gave a marked increase in growth. It was demonstrated that the growth of lead sulphide took place at the lead-lead sulphide interface. The rate of growth of the film is determined not by the diffusion through the film but by the rate of formation of lead sulphide.
Acknowledgments are expressed to Professor D.N. Nasledov for his continued interest and for his comments on the results. There are 5 figures, 2 tables and 12 references, 4 of which are English, 3 German and 5 Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut AN SSSR (Leningrad Physico-technical Institute of the Ac.Sc.,USSR)

SUBMITTED: July 13, 1959

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4

80531

18.7520 S/126/60/009/05/011/025
E021/E335

AUTHORS: Dorin, V.A. and Filaretova, G.M.

TITLE: The Growth of a Lead Selenide Film

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 5, pp 718 - 721 (USSR)

ABSTRACT: Experiments were carried out on the diffusion of liquid selenium in contact with solid lead. The apparatus used (Figure 1) ensured that no diffusion could take place in the time taken to heat up to the experimental temperature. The apparatus was evacuated to 10^{-5} mm Hg and placed in a thermostat. The diffusion layer formed after several minutes consisted of two parts. Figure 2 shows the selenium 1, a porous PbSe layer 2, a compact PbSe layer 3 and lead 4. X-ray analysis showed that both the diffusion layers contained PbSe. Figure 3 shows the structure of the porous layer which consists of a network of lead selenide crystals, the pores of which are filled with amorphous selenium. Microhardness measurements confirmed this, giving values of 75 kg/mm^2 for PbSe and 57 kg/mm^2 for Se. The thickness of the compact layer

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S/126/60/009/05/011/025
E021/E335

The Growth of a Lead Selenide Film

was always the same under the same conditions but the thickness of the porous layer varied even when prepared under exactly the same conditions. With increase in time of diffusion, the compact layer increased in thickness and the porous layer decreased. A similar picture was obtained with increase in temperature. Oxygen had a pronounced effect on diffusion. The layer produced with the apparatus filled with air was several times thicker than that produced in vacuo. Only a thin compact layer (and no porous layer) is formed with solid selenium in contact with lead. The mechanisms of film formation with solid and liquid selenium are obviously different. Lead atoms diffuse into the liquid selenium to give the porous layer. This was confirmed by carrying out tests with lead covered with lead sulphide.
There are 4 figures and 6 references, 1 of which is English and 5 are Soviet.

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S/126/60/009/05/011/025
E021/E335

The Growth of a Lead Selenide Film

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR, Leningrad
(Physics-engineering Institute of the Ac.Sc., USSR, Leningrad)

SUBMITTED: July 13, 1959 - initially;
December 7, 1959 - after revision.

Card 3/3

80227
S/076/60/034/04/18/042
B010/B009

5.2100

AUTHORS: Dorin, V. A., Nasledov, D. N., Tartakovskaya, F. M. (Leningrad)

TITLE: Preparation of a Titanium Dioxide Semiconductor on Titanium at Low Oxygen Pressures

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 4, pp. 809 - 814

TEXT: The oxidation of titanium in a gaseous phase obtained by heating powdered titanium oxide was investigated. In this way a gaseous phase containing only small amounts of oxygen was obtained. Titanium foils (0.6 mm thick, 20 X 20 mm^2) with at most 0.08% C, 0.04% N_2, 0.5% Fe + Ni, and traces of Cu were oxidized. The titanium oxide powder was annealed at 800° for three hours prior to use. In the first series of experiments anatase powder was used, in the second, rutile powder. Working temperatures ranged from 700° to 1100°, the weight increase in the titanium foil undergoing oxidation was determined by weighing. In the first series of experiments the color of the oxide film was observed to change with temperature, i.e., at 650-800° the oxide is light gray, but changes into dark gray and, at temperatures above 850°, into dark blue. An X-ray analysis showed that at

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Preparation of a Titanium Dioxide Semiconductor on Titanium at Low Oxygen Pressures

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S/076/60/034/04/18/042
B010/B009

temperatures up to 850-900° an oxide film with a rutile structure forms. At 1100° two oxide layers were found, namely a thin upper layer of Ti_3O_5 and a lower layer the X-ray picture of which was different, although its composition is likewise Ti_3O_5. The dependence of the growth of the oxide layer upon time was found to be parabolic, while the temperature dependence is governed by an exponential law. The results of the second series of experiments (Table) show that the sample weight increases at 700-900° only. The oxidation of titanium takes place while the titanium dioxide powder is greatly reduced. The oxide film forming during the process has an electrical conductivity of the electronic type. This electrical conductivity depends on the temperature at which the oxide film is produced. G. P. Luchkin and G. G. Il'in are mentioned in the text. There are 5 figures, 1 table, and 19 references, 4 of which are Soviet.

SUBMITTED: June 27, 1958

Card 2/2

BAKAYEV, A.V.; GELLER, I. Kh.; DORIN, V.A.; ZAKHAROV, M.P.; NASLEDOV, D.N.; SOLOV'YEV, R.A.

Method for investigating potential distribution in selenium rectifying cells. Zav.lab. 27 no.10:1240-1242 '61. (MIRA 14:10)

1. Leningradskiy politekhnicheskiy institut im. M. I. Kalinina.
(Selenium—Electric properties)

S/139/63/000/001/012/027
E202/E420

AUTHORS: Bakayev, A.V., Geller, I.Kh., Dorin, V.A., Zakharov, P.M., Naslodov, D.N., Solov'yev, R.A.

TITLE: Distribution of potential in selenium rectifying elements between electrodes

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Fizika, no.1, 1963, 78-84

TEXT: Results of measuring potential distribution in selenium rectifying elements in the conducting direction are described. To explain in detail the mechanism of potential distribution between the electrodes, measurements were carried out at points separated by a distance of 5 μ. Since the thickness of selenium layer varies from 50 to 100 μ it was necessary to measure the potential at 10 to 20 points. In order to carry out the measurements the layer of selenium and the p-n junction region were stripped and a transverse section prepared. Both types of rectifiers, i.e. those with p-n junction between the upper electrode and the layer of selenium, and those in which the p-n junction lies between the layer of selenium and the base, were investigated. The method was based on

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Distribution of potential ...

measuring the difference of potential between one of the electrodes and a probe, the latter being placed at various points on the surface of the transverse section of the element. A special instrument incorporating a microhardness gauge of the diamond pyramid type in which the latter was replaced by a steel wedge-shaped probe was used. During measurements the probe was pressed into the selenium in order to obtain reliable results. The width of the indentation made by the probe was 1.5 to 2 μ, hence the potential could be measured at points separated by a distance of 5μ. Since the probe contact with selenium has a considerable resistance of the order of 10^8 to 10^9 ohms, a high resistance voltmeter was used in the measurements. This comprised a potentiometer with a center zero electrometer sensitive to a current of 10^{-11} A. The measurements had an absolute error of 0.001 V. Considerable care was taken in the preparation of the transverse sections. The results have shown that the main fraction of the potential applied to the element in the conducting direction falls over the p-n junction region, on the other hand the layer of selenium accounts for not more than 25% of the above fall. In addition to plotting

Distribution of potential ...

the potential against the distance over the CdS-(orCdSe)-Se-Bi_2Se_3-Al portions of the sandwich, preliminary volt-ampere characteristics of both types of rectifier were measured on polished and unpolished samples. There are 6 figures.

ASSOCIATION: Leningradskiy politekhnicheskiy institut imeni M.I.Kalinina (Leningrad Polytechnic Institute imeni M.I.Kalinin)

SUBMITTED: August 22, 1961

Card 3/3

L 14535-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AP3005310 S/0181/63/005/008/2065/2069

AUTHOR: Dorin, V. A.; Petrukova, A. Ya.

TITLE: Investigation of electrical characteristics of TiO_{2-x}-Ag contact with an intermediate insulating layer

SOURCE: Fizika tverdogo tela, v. 5, no. 8, 1963, 2065-2069

TOPIC TAGS: electrical-contact characteristic, electrical characteristic, contact characteristic, titanium oxide, titanium-oxide contact characteristic

ABSTRACT: The electrical characteristics of a TiO_{2-x}-Ag contact with an insulating layer have been investigated at room temperature and at 400C. The characteristics obtained were compared with those of a system without an insulating layer. It was found that unipolar conductivity exists up to 500C in specimens with insulating layers. Rectification takes place in the area of contact with the intermediate layer at 400C. At 300C the specimen had equal conductivity in both directions. In the region of low voltages the volt-ampere characteristics of the specimens indicated that the introduction of an insulating layer

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L 14535-63

ACCESSION NR: AP3005310

at room temperature only increases the resistance of the system. When a system with an insulating layer is heated to 400C the rectification factor is 30 at 100 mv. An analysis of separate sections of the volt-ampere characteristics in the reverse direction showed that the current increased proportionally with the increase of voltage up to approximately 1 v. Above 4 v, an exponential dependence takes place either at low or high temperature. The same dependence was observed in the contact area of Ag-TiO_{2-x} at lower voltages. Thus, the introduction of an insulating layer consisting of a material different from TiO_{2-x} does not change the qualitative picture of the characteristics. It serves only to elevate the temperature (by 200—250C) at which rectification takes place. Orig. art. has: 5 figures, 5 formulas, and 2 tables.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Leningrad Physicotechnical Institute, AN SSSR)

SUBMITTED: 28Jan63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 006 OTHER: 003

Card 2/2

DORIN, V.A.; PATRAKOVA, A.Ya.; TARTAKOVSKAYA, F.M.

Effect of an insulating layer on the electrical properties of rectifiers with a TiO_{2-x} base. Radiotekh. i elektron. 8 no.8:1462-1465 Ag '63. (MIRA 16:8)

1. Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR.
(Electric current rectifiers)

DAVIDOVICH, N.M.; DORIN, V.A.

Electric investigation of TiO_{2-x} diffusion layers on titanium. Fiz. met. i metalloved. 16 no.2:273-277 Ag '63. (MIRA 16:8)

1. Leningradskiy fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.

(Diffusion coatings—Electric properties)
(Titanium oxide)

DORIN, V.A.; KUZNETSOV, B.I.

Device for perforating orifices in electron microscope preparation sieves. Zav.lab. 29 no.8:1012 '63. (MIRA 16:9)

1. Leningradskiy fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR.

(Electron microscopy)

DORIN, V.A.; KOZLOV, M.M.

Measurements of potential distribution in semiconductor rectifiers by means of a probe. Izv. vys. ucheb. zav.; fiz. no. 3: 97-101 '64. (MIRA 17:9)

1. Leningradskiy politekhnicheskiy institut imeni Kalinina.

ACCESSION NR: AP4034052 S/0126/64/017/004/0536/0540

AUTHORS: Dorin, V. A.; Tartakovskaya, F. M.

TITLE: A study of the influence of oxygen generated during the reduction of TiO_2 on the oxidation of titanium

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 4, 1964, 536-540

TOPIC TAGS: titanium oxide, titanium, annealing, sodium fluoride, hydrochloric acid, oxide formation, rutile titanium

ABSTRACT: The effects of oxygen (produced by reduction of TiO_2 powder) on the physical properties of the oxide layer and on the rate of its growth were studied. It was established that it is possible to change the electrophysical properties of the TiO_{2-x} layer by immersing titanium in the oxide powder. Circular plates of Ti, 10 mm in diameter and 1.2 mm thick and with less than 0.1% impurities, were used for the oxidation experiments. Before oxidation, the plates were annealed at 1000C for 1 hour, degreased, and then pickled in an aqueous solution of 5% NaF with 12% HCl. These plates were set vertically in porcelain debitenses and covered with TiO_2 powder pre-annealed at 800C for 3 hours. Oxidation occurred in a tubular furnace through which a constant current of steam was passed. Microphotographs of cut

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ACCESSION NR: AP4034052

sections were taken at 800C. Radiographic study of the structure of the material showed that the layer contained dioxide with rutile structure. As observed earlier by D. I. Layner and M. I. Tsy*pin (FMM, 1960, 10, 543), the oxidation of titanium in air proceeded through molecular oxygen, whereas in steam it proceeded through atomic oxygen. The formation of atomic oxygen during the reduction of TiO_2 explained the similarities in the physical properties of the layers formed in steam and in a steam-air mixture. The increase in the contribution of atomic oxygen in the oxide layer was responsible for the growth of this layer with significant deviation in the stoichometric properties. Orig. art. has: 5 figures, 1 formula, and 1 table.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR (Leningrad Physico-technical Institute, AN SSSR)

SUBMITTED: 28Apr63

SUB CODE: MM

NO REF SOV: 005

ENCL: 00

OTHER: 001

Card 2/2

ACCESSION NR: AP4013307 S/0032/64/030/002/0206/0206

AUTHORS: Dorin, V. A.; Kozlov, M. M.

TITLE: Silicon carbide probe for testing semiconductor materials

SOURCE: Zavodskaya laboratoriya, v. 30, no. 2, 1964, 206

TOPIC TAGS: silicon carbide, silicon carbide probe, semiconductor probe

ABSTRACT: A silicon carbide probe with a resistivity of 10 ohm-cm has been devised for testing hard semiconductor materials. The probe (see Fig. 1 of Enclosure) consists of a sharp point (1) which is fixed with tin in a copper holder (2). The holder is attached to fluorine-bearing plates (3) with a screw (4). The point scribes a line about 1.5μ wide. The contact resistance of the probe is 10^9 ohm. This instrument can be used for testing selenium and titanium dioxide. Orig. art. has: 1 figure.

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnical Institute)

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L 14976-65 EWT(m)/EWP(t)/EWP(b) Pe-4 EWA(c)/SSD/ESD(gs) RDW/JD
ACCESSION NR: AP5000162 S/0032/64/030/012/1490/1490

AUTHOR: Dorin, V. A.

TITLE: Charcoal-silver replicas for investigating sulfur, selenium, and tellurium

SOURCE: Zavodskaya laboratoriya, v. 30, no. 12, 1964, 1490

TOPIC TAGS: electron microscopy, surface property, sulfur, selenium, tellurium

ABSTRACT: A method is described for obtaining charcoal replicas without defects from the surfaces of sulfur, selenium, tellurium, and some of their chemical compounds. A layer of aluminum, 1 μ thick, is vaporized in a vacuum onto the surface to be investigated. Since aluminum is too brittle to be used alone, a layer of silver is applied, and further processing is the same as for the ordinary charcoal replica. Electron diffraction and electron microscope measurements show no reaction products between the layers.

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute)

SUBMITTED: 00 ENCL: 00
SUB CODE: IC, NP NO REF SOV: 000 OTHER: 000

Card 1/1

L 8555-66

ACCESSION NR: AP5021178 UR/0139/65/000/004/0112/0115 36 35 B

AUTHOR: Dorin, V. A.; Kozlov, M. M.

TITLE: The effect of defects in a p-n junction on the drift phenomenon in selenium rectifiers

SOURCE: IVUZ. Fizika, no. 4, 1965, 112-115

TOPIC TAGS: selenium rectifier, current stabilization, pn junction, rectification, electric conductivity/ TVS, AVS

ABSTRACT: The drift of selenium rectifiers TVS and AVS was investigated from the point of view of the behavior of the channels of local conductivity in a p-n junction. The fall-off of the voltage was measured for a constant current. An automatic recording potentiometer (EPP-40) with an input resistance of 10^{13} ohm was used. The current source was a battery of dry cells with a total emf of 1000 v. The voltage on the rectifier did not exceed 40 v. The investigations were carried out on pSe-nCdSe and pSe-NCdS hetero junction 40 x 40 mm in size. It was found that the resistance of a rectifier increases in time at small currents and decreases at large currents. The drifting is due to a large degree to local inhomogeneities whose conductivity varies with time. For some rectifiers there are several current values at which there is no drifting. This can be attributed to

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L 8555-66

ACCESSION NR: AP5021178

compensation of the loss of some conduction channels by formation of new conductivity channels. Orig. art. has: 7 figures.

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute)

SUBMITTED: 08Jan64 ENCL: 00 SUB CODE: SS, EE

NR REF SOV: 000 OTHER: 003

jw

Card 2/2

L 27746-66 EWT(l)/EWT(m)/T/EEC/EWA(h)/EWP(t)/ETI IJP(c) JD/AT

ACC NR: AP6001590 (N) SOURCE CODE: UR/0120/65/000/006/0189/0190

AUTHOR: Dorin, V. A. 43

ORG: Leningrad Polytechnical Institute (Leningradskiy politekhnicheskiy institut) B

TITLE: A device indicating the position of the p-n junction in silicon rectifiers

SOURCE: Pribory i tekhnika eksperimenta, no. 6, 1965, 189-190

TOPIC TAGS: crystal rectifier, physics laboratory instrument

ABSTRACT: A simple system is described for measuring the potential jump at the p-n junction in a thin silicon crystal plate. The transition region was measured with a precision of one micron. The p-n position was fixed by using a probe needle made of a tungsten wire. The adjustment of the needle point to the right position was made by means of the microscopes of the PMT-3 microhardness-meter and of the horizontal IZA-2 comparator. The electrical circuit included a storage battery, a recording EPP-40 electrometer with a resistance of 10^{11} to 10^{13} ohms and a d-c electrometer amplifier of U1-2 type. The arrangement was outlined in a diagram. The distribution of potential illustrating the p-n position was shown in a curve. Orig. art. has: 2 figures.

SUB CODE: 09 / SUBM DATE: 5Nov64 / ORIG REF: 003 / OTH REF: 001

UDC: 537.33

Card 1/1

L 01020-66 EWT(l)/EWT(m)/EWP(i)/EWG(m)/T/EWP(t)/EWP(b)/EWA(h) IJP(c) RDW/
JD/AT

ACCESSION NR: AP5020130 UR/0109/65/010/008/1518/1522
539.293.011.41

AUTHOR: Dorin, V. A.; Kozlov, M. M.

TITLE: Investigation of the potential distribution in the reverse direction in a p-Se layer adjacent to n-CdSe

SOURCE: Radiotekhnika i elektronika, v. 10, no. 8, 1965, 1518-1522

TOPIC TAGS: selenium, cadmium selenide, electric potential, p n junction, semiconductor device

ABSTRACT: The potential was measured at the polished end of a Se layer 80—100 μ thick. Se conductivity was 1—10 ohm·m. A thin (under 1 μ) film of n-CdSe obtained by a reactive-diffusion process formed a junction with Se. A voltage of 30—35 v was applied to the specimen, and a steel probe was set at 4 μ from the junction. Potential-distribution curves were measured. It was found that 1) the space charge at a distance of 4 μ from the junction is practically nil; 2) the reactive-diffusion-produced contact is, in fact, a defective hetero-p-n junction (conducting channels can be found in the junction); and 3) the nonuniformity of the p-n junction can be

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L 01828-66

ACCESSION NR: AP5020130

adequately studied by measuring the potential in Se in the reverse direction. Orig. art. has: 4 figures, 1 formula, and 1 table. [03]

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute)

SUBMITTED: 21Jan64 ENCL: 00 SUB CODE: SS,EC

NO REF SOV: 005 OTHER: 003 ATD PRESS: 4086

Card 2/2

DAVIDOVICH, N.M.; DORIN, V.A.

Screw dislocations in diffusion layers. Fiz. met. i metalloved. 19 no.4:626-627 Ap '65. (MIRA 18:5)

1. Leningradskiy politekhnicheskiy institut imeni Kalinina.

DORIN, V.A.; KOZLOV, M.M.

Defects in p - n-junctions affecting creep in selenium rectifiers. Izv. vys. ucheb. zav.; fiz. 8 no.4:112-115 '65. (MIRA 18:12)

1. Leningradskiy politekhnicheskiy institut. Submitted January 8, 1964.

25(1) PHASE I BOOK EXPLOITATION SOV/1593

Dorin, Vasiliy Ivanovich

Tochnaya shtampovka detaley optiko-mekhanicheskikh priborov (Precision Cold-pressing of Parts for Optical-mechanical Devices) Moscow, Oborongiz, 1958. 458 p. 7,050 copies printed.

Ed.: V.Ya. Shekhter, Candidate of Technical Sciences; Ed. of Publishing House: A.G. Kuznetsova; Tech. Ed.: V.P. Rozhin; Managing Ed.: A.S. Zaymovskaya, Engineer.

PURPOSE: This book is intended for engineers and technicians in optical and mechanical plants who deal with metal stampings. It may also be used by engineers in the instrument and watchmaking industry and by students interested in this branch of mechanical engineering.

COVERAGE: The book deals with the cold working of metal, in particular with the stamping of small precision parts for

Card 1/9

photographic cameras and optical equipment manufactured in the USSR. Modern methods of precision stamping on compound and progressive dies and some theoretical aspects of metal shearing are described. A new method is mentioned which is said to combine stamping and machining of parts while the parts are still in strip form. Locating parts for subsequent operations is accomplished by means of perforations along the edges of the strip. Basic forging, drawing, and upsetting operations are explained. The use of dies on an industrial scale basis, the number of dies available, and the most efficient use of these tools are discussed. Explanatory illustrations, diagrams, graphs and tables are provided. There are 52 references, of which 49 are Soviet and 3 German.

Precision Cold-pressing of Parts (Cont.) SOV/1593

Card 3/9

AVAILABLE: Library of Congress

GO/rj
5-28-59

Card 9/9

DORIN, Viktor Sergeyevich; MEYLUNAS, V.F.otvetstveny redaktor; [redacted]VICH, G.I.,redaktor; KAMOLOVA, V.M.,tekhnicheskiy redaktor

[How and why a ship floats] Kak i pochemu plavaet sudno. Leningrad, Gos. soiuznoe izd-vo sudostroit. promyshl., 1957 113 p. (MLRA 10:5)
(Ships)

DORIN, V.S., kand. tekhn. nauk

Using differential weight equations. Sudostroenie 25 no.7:7-10 Jl '59. (MIRA 12:12)
(Naval architecture)

SEMENOV-TYANSHANSKIY, V.V., doktor tekhn.nauk; DORIN, V.S., kand.tekhn.nauk

Problems of ship reserve buoyancy and stability examined at the Conference on the Revision of the International Convention of 1948 on the Protection of Human Life at Sea. Sudostroenie 28 no.5:1-4 My '62. (MIRA 15:7)
(Lifesaving—Congresses) (Stability of ships)

DORIN, V.S., kand.tekhn.nauk; VOLKOV, B.N., inzh.

Standardizing the reserve buoyancy of seagoing ships. Sudostroenie 28 no.5:4-12 My '62. (MIRA 15:7)
(Stability of ships)

DORIN, V.S., kand.tekhn.nauk; ARAKEL'YAN, G.V., inzh.; LOGACHEV, S.I., inzh.; NIKOLAYEV, M.M., inzh.

Advantage of designing large-tonnage tank vessels with excess metacentric height. Sudostroenie 29 no.7:5-8 Jl '63. (MIRA 16:9)

(Tank vessels) (Naval architecture)

DORINOVSKAYA, A.P. [DORYNOVS'KA, A.P.]

Effect of drug-induced sleep on erythropoiesis during the post-hemorrhagic period [with summary in English] Fiziol.zhur. [Ukr.] 4 no.3:339-347 My-Je '58 (MIRA 11:7)

1. Sverdlovskiy medichniy institut, kafedra patologichnoi fiziologii.
(SLEEP)
(ERYTHROCYTES)

DORINOVSKAYA, A.P., Cand Med Sci -- (diss) "Effect of ~~therapeutic~~ drugged sleep upon the regeneration of the blood in experimental anemia." Sverdlovsk, 1959, 15 pp (Sverdlovsk State Med Inst) 200 copies (KL, 33-59, 121)

DORIS, Spalatin

Cruises with the Jadrolinija ships. Medun transp 8 no.6:416-418 Je '62.

LEVASHOVA,L.B.; DORIYENKO,Ye.P.; DEGTYAREV,V.F.

Radioactive tracer study of cobalt thiocyanate distribution between immiscible solvents. Zhur.ob.khim.25 no.6:1066-1072 Je '55.
(MLRA 8:12)

1. Ural'skiy politekhnicheskiy institut
(Cobalt thiocyanates)

KHILINSKIY, F.A.; LOTYSHEV, I.P.; LEBEDENKO, G.B.; SHAVKUNOVA, N.D.; DORIZO, A.P.; TERNOVAYA, K.G.; ANTIPOV, A.S., obshchestv. red.; BABAK, Yu.M., tekhn. red.

[Goryachiy Klyuch] Goriachii kliuch. Izd.2., ispr. i dop. [By] F.A.Khilinskii i dr. Krasnodarsk, Krasnodarskoe knizhnoe izd-vo, 1963. 84 p. (MIRA 17:2)

1. Glavnyy vrach sanatoriya No.2 Kurorta Goryachiy Klyuch, Kavkaz (for Lebedenko). 2. Sanatoriy No.1 Kurorta Goryachiy Klyuch, Kavkaz (for Shavkuncva,Ternovaya).3,Zamestitel' glavnogo vracha po meditsinskoy chasti sanatoriya No.2 Kurorta Goryachiy Klyuch, Kavkaz (for Dorizo).

GOYA, I., BUKUR, N., DORKA, N., RUB, D. (Bukharest)

Interrelations of rheumatic arteritis, periarteritis nodosa and rheumatic diseases; preliminary report. Klin.med. 36 no.10:68-75 O '58 (MIRA 11:11)

(RHEUMATISM, compl.
arteritis, relation to periarteritis nodosa (Rus))
(ARTERITIS, etiol. & pathogen.
rheum., relation to periarteritis nodosa (Rus))
(PERIARTERITIS, NODOSA
relation to rheum. arteritis (Rus))

DORKIN, Vasiliy Grigor'yevich; [Dorkin, V.R.]; UKSUSOV, D. [Uksusov, D.], red.; SLAVYAKIN, I., tekhn.red.

[Selecting and training collective-farm specialists] Padbor i vykhavanne kalhasnykh kadrau. Minsk, Dziarzh.vyd-va BSSR, Red.masava-palit.lit-ry, 1960. 52 p. (MIRA 14:3)

(Collective farms) (Agricultural education)

S/144/61/000/003/004/004
E194/E435

9.6130

AUTHORS: Lifanov, V.A., Candidate of Technical Sciences, Docent, Head of Department of Electrical Machines and Instruments and Dorm, A.G., Senior Instructor

TITLE: An Investigation of Commutation Armature Reaction in d.c. Machines using Hall-Effect Pick-ups

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1961, No.3, pp.109-115

TEXT: This article describes a method of obtaining curves of magnetic induction distribution in the air gap of a d.c. machine using Hall-effect pick-ups. Hall-effect pick-ups used in this work were single crystals of germanium made in the Laboratoriya elektricheskikh mashin ChPU (Electrical Machines Laboratory of ChPU) and their dimensions were 10 x 4 x 0.45 mm. Calibration work showed that with inductions in the range 100 to 15000 gauss and currents of 30 to 50 mA, the signals obtained could be measured in an ordinary electromagnetic voltmeter without preliminary amplification. The pick-up was used to investigate magnetic fields in the air gap of a motor type ПН-10 (PN-10);

it was attached to the outer surface of one of the armature teeth. The pick-up was connected to a terminal board by flexible leads arranged so that the armature could be turned through a double pole pitch. Smooth armature rotation was ensured by a worm drive. Curves of magnetic field distribution in the air gap of d.c. machine type PN-10 are plotted in Fig.3, in which curve 1 corresponds to the armature field, curve 2 to the field of the main poles and curve 3 to the resultant field. Determination of the m.m.f. of commutational armature reaction is then considered. When the commutation in d.c. machines is accelerated or retarded there arise m.m.f.'s of commutating currents of the short-circuited armature sections which either strengthen or weaken the flux of the main poles. The fundamental theory of the effect is described in order to explain the basis of the experiments. The test circuit used is shown in Fig.4 in which the machine investigated, denoted ИМ in the diagram, can act as a generator or motor, it being on the same shaft as the auxiliary machine denoted BM. In this case the Hall-effect pick-up was attached under the middle of the main pole of the machine studied. The test consists in taking voltage curves at the output of the Hall-effect pick-up with the

machine acting as both generator and motor. Under both conditions the speed, armature and field currents are the same. The work was done on a d.c. generator type ПН-100 (PN-100) of 115 V, 13.3 kW, 116 A, 1480 r.p.m. A single crystal germanium Hall-effect pick-up made in the Institut poluprovodnikov AN SSSR (Semiconductors Institute AS USSR) was used, its dimensions were 5 x 3 x 0.45 mm. The operating current during the test was 10 mA. The results are plotted in Fig.5. The point of intersection of the generator and motor curves corresponds to the case when the fluxes in the machines are equal in both cases. This is valid provided only that there are no m.m.f. of commutating currents, which corresponds to straight line commutation. Fig.5 also plots the difference between the generator and motor voltages and so in effect shows the change of voltage on passing from the generator to the motor conditions. This change is due to the m.m.f. of commutation currents. This m.m.f. may be determined by a special test which consists in taking a curve of the voltage on the output of the Hall-effect pick-up as function of the field current at no-load. The curve, Fig.7, is then readily constructed; it shows the relationship between the m.m.f. of commutational armature

An Investigation of Commutation ...

reaction and the boost current in the d.c. motor. It will be seen that the boost current of 3.6 A corresponds to straight line commutation. It is concluded that this method of determining the magnetic field in the air gap of a d.c. machine is simple and easy and can be used both on the factory test bed and in teaching laboratories. The proposed method of determining the m.m.f. of commutating currents permits rapid and accurate assessment of machine commutation. There are 7 figures, 2 tables and 4 references: 3 Soviet and 1 non-Soviet.

ASSOCIATION: Kafedra elektricheskikh mashin i apparatov Chelyabinskogo politekhnicheskogo instituta (Department of Electrical Machines and Instruments of the Chelyabinsk Polytechnical Institute)

SUBMITTED: October 6, 1960

LIFANOV, V.A., kand.tekhn.nauk; DORM, A.G., inzh.

Use of Hall transducers for measuring the rotor angle of synchronous machines. Vest. elektroprom. 34 no.2:62-63 F '63. (MIRA 16:2)
(Electric machinery, Synchronous—Measurements)

LIFANOV, V.A., kand. tekhn. nauk, dotsent; LORM, A.G., inzh.; ROTENBERG, M.I., inzh.

Method for the automatic synchronization of synchronous machines. Izv. vys. uchab. zav.; energ. 7 no.10:84-87 O '64. (MIRA 17:12)

1. Chelyabinskiy politekhnicheskiy institut.

L 01132-66

ACCESSION NR: AP5017467 UR/0144/65/000/006/0718/0720
621.313.33+621.3.047

AUTHOR: Lifanov, V. A. (Docent); Dorm, A. O. (Senior lecturer)

27
B

TITLE: Measuring and oscillographing the slip in induction machines

SOURCE: IVUZ. Elektromekhanika, no. 6, 1965, 718-720

TOPIC TAGS: induction machine, slip

ABSTRACT: A method of measuring the slip of an induction machine by means of a commutator-type tachometer generator mechanically coupled to the machine is suggested. The tachogenerator stator has distributed 3-phase winding whose number of poles equals to that of the main machine; both are connected to the same a-c supply. EMF across the tachogenerator brushes, directly proportional to the slip of the induction machine, can be easily measured by an oscillograph. Oscillograms of the slip of a 3.6-kw, 380-v, 2890-rpm induction motor when the rated load was suddenly thrown on (or varied) are presented. An auxiliary use of a Hall generator is also suggested. Orig. art. has: 6 figures and 6 formulas.

Card 1/2

L 01132-66
ACCESSION NR: AP5017467

ASSOCIATION: Chelyabinskiy politekhnicheskiy institut (Chelyabinsk Polytechnic Institute)

SUBMITTED: 28Nov62 ENCL: 00 SUB CODE: EE

NO REF SOV: 001 OTHER: 00

Card 2/2 DP

BIRYULYA, I.N., kand.tekhn.nauk, dotsent; DORM, F.A., inzh.

Adjustment and study of the commutation of large d.c. generators.
Energ. sbor. no.2:3-12 '59. (MIRA 15:1)
(Electric generators)
(Commutation (Electricity))

DORMAKOVICH, Petr Andreyevich; MIKHALKOV, Aleksandr Vladimirovich; PETROV, Aleksandr Vasil'yevich; POYARKOV, K.M., red.; BORUNOV, N.I., tekhn. red.

[Manufacture and maintenance of gas-discharge light fixtures] Izgotovlenie i obsluzhivanie gazosvetnykh ustanovok. Moskva, Gosenergoizdat, 1962. 54 p. (Biblioteka elektromontera, no.72) (MIRA 15:12)

(Fluorescent lamps) (Fluorescent lighting)

DORMAKOVICH, P.A.

Methods for detecting faults in gas-discharge lamps in commercial signs. Prom. energ. 18 no.11:60 N '63. (MIRA 16:12)

SHPARBER, L.Ya.; DORMAN, A.I.

Ladle travel in one-lip casting of iron. Metallurg 5 no. 12:10-12 D '60. (MIRA 13:11)

1. Magnitogorskiy metallurgicheskiy kombinat.
(Blast furnaces—Equipment and supplies)

DORMAN, A.I.; LESHCHINSKIY, L.Z.; KIYASHKO, V.S.; BAKSHINOV, A.S.; LUKASHOVA, A.N.

Pneumatic delivery of specimens of cast iron, steel, and slag to the chemical laboratory. Metallurg 9 no.10:12-13 O '64 (MIRA 18:1)

1. Magnitogorskiy metallurgicheskiy kombinat.

ROGANOV, Boris Ivanovich, doktor tekhn. nauk [deceased]; DZHABAROV, Gafar Dzhabarovich, kand. tekhn. nauk; KOTOV, Dmitriy Andreyevich, kand. tekhn.nauk; BALTABAYEV, Sultan Dusayevich, kand. tekhn. nauk; SOLOV'YEV, Nikolay Dmitriyevich, inzh.; DORMAN, I.M., retsenzent; DUKHOVNYY, F.N., red.; SOKOLOVA, V.Ye., red.

[Primary processing of cotton] Pervichnaia obrabotka khlopka. [By] B.I.Roganov i dr. Moskva, Legkaia industriia, 1965. 485 p. (MIRA 18:12)

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

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 analyzed 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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L 65298-65

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 [illegible] x 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: 05Oct64 ENCL: 00 SUB CODE: AA

NO REF SOV: 006 OTHER: 009

Card 2/2

L 16028-66 EWT(1)/EWA(h)/FCC GW
ACC NR: AT6003522 SOURCE CODE: UR/3184/65/000/007/0005/0017

AUTHOR: Dorman, I. V.; Dorman, L. I. (Dr. of Physico-Mathematical Sciences) 30, B+1

ORG: none

TITLE: Investigation of the 11-year cosmic ray cycle (from data of observations at sea level)

SOURCE: AN SSSR. Mezhduvedomstvennyy geofizicheskiy komitet. Kosmicheskiye luchi, no. 7, 1965, 5-17

TOPIC TAGS: cosmic ray, geomagnetism, sunspot cycle, magnetic rigidity

ABSTRACT: Data from a world-wide network of neutron monitors, measurements of latitude effects in the neutron and hard components of cosmic rays at sea level, and stratospheric measurements of proton and α-particle fluxes in the low energy region made from high altitude balloons are used as a basis for analyzing the 11-year cosmic ray cycle. It is found that the amplitude of the 11-year variation increases with a reduction in the geomagnetic cutoff hardness R which indicates that the primary spectrum of the 11-year variation decreases with an increase in R. The lag in

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L 16028-66

ACC NR: AT6003522

changes of cosmic ray intensity with respect to changes in solar activity increases with a reduction in the penetrating power of the particles. There is a close relationship between cosmic ray intensity, the number of sunspots and radiation flux at 10.7 cm. When considering variations for shorter periods of time, there is a closer relationship between the intensity of cosmic rays and the K_p-index of magnetic activity, while longer time intervals show a closer correlation between intensity and the number of sunspots. Hysteresis phenomena are studied on the basis of neutron monitor data and observations in the stratosphere. For $R>3$ Bev the energy spectrum for the 11-year cycle is given in the form $\delta D(R)/D(R) \sim R^{-(0.8-0.9)}$ which is steeper for $R>13$ Bev with $\gamma>2$. The spectrum of the 11-year cycle was considered together with delay phenomena to determine the scattering path as a function of particle hardness and the dimensions of the modulating space. The magnetic field intensity in scattering nonhomogeneities is determined for various assumptions on the relationship between the average dimensions of nonhomogeneities and the distance between them. The contribution of variability in the lag effect is evaluated. Orig. art. has: 8 figures, 16 formulas.

SUB CODE: 08/ SUBM DATE: 00/ ORIG REF: 013/ OTH REF: 019

Card 2/2

DORMAN, L. I.

USSR.

1028. The influence of meteorological factors on the latitude effect of the hard component of cosmic rays and the process of the generation of mesons. L. I. DORMAN. Letter in *Zh. éksper. teor. Fiz.*, 26, No. 4, [illegible] in Russian.

The author's recent work [*Dokl. Akad. Nauk, SSSR*, 94, No. 3, 411; 95, No. 1, 49 (1954)] makes it possible to correct the latitude effect for the increase of intensity associated with the temperature variation from the equator to $\lambda = 55°$ (some 4%). The corrected intensity levels off very clearly between 35°–40°, corresponding to a minimum primary proton energy of $6\text{–}8 \times 10^9$ eV. This is interpreted as meaning that protons with less energy cannot generate μ-mesons with energy $> 2 \times 10^8$ eV, necessary for their detection at sea level.

W. J. SWIATECKI

Sci Res. Inst. Terrestrial Magnetism.

DORMAN, L.I.
USSR/Nuclear Physics - Cosmic rays in meteorology

Card 1/1 Pub. 147-3/16

Author : Dorman, L. I.; Kuz'min, A. I.; Tyanutova, G. V.; Feynberg, Ye. L.; Shafer, Ya. G.

Title : Variations in the intensity of cosmic rays and the role of meteorological factor

Periodical : Zhur. eksp. i teor. fiz. 26, 537-544, May 1954

Abstract : Briefly expound the results of an experimental and theoretical study of the influence of meteorological factors on the observed (at sea level) intensity of the hard component of cosmic rays. Show that knowing the distribution of temperature in the atmosphere above the observation point one can allow for the meteorological factors with an accuracy up to 0.1 to 0.2% in the intensity of cosmic rays. Here the remaining divergence lies within the limits of error of the given meteorological sounding. It turns out that the seasonal variations in the intensity of the hard component are due to meteorological factors. The daily variations are essentially masked by these factors.

Submitted : October 27, 1953

[illegible], L. I.

"On the Theory of Meteorological Effects on Cosmic Radiation."
Dokl. Akad. Nauk SSSR, V. 94, No. 3, 433-6, 1954.

An analytical expression relating the μ-meson intensity at a given height to various meteorological factors. is deduced.

Sci. Res. Inst. Terrestrial Magnetism.

LAIKMAN, L. I.

"On the Temperature Effect of the Hard Component of Cosmic Rays." Dokl. Akad. Nauk SSSR, Vol. 95, No. 1, 49-52, 1954.

Duperier's theory of this effect does not, in general, lead to values of the temperature coefficient which are in agreement with experiment.

DORMAN, L. I.; KAMINER, N. S.; KOYAVA, V. K., SHAFER, Yu. G. and SHVARTSMAN, B. F.

"Observation of the Large Cosmic Ray Increase of February 23, 1956 in the USSR."

Scientific Research Institute of Terrestrial Magnetism (Moscow)
Sverdlovsk Geophysical Observatory
Tbilisi Cosmic Ray Station
Yakutsk Affiliate of the Academy of Sciences of the USSR
Cape Schmidt Cosmic Ray Station

Nuclear Physics, 1. No. 8, 1956, p. 585-592

9402

ON THE ORIGIN OF VARIATIONS IN COSMIC RAYS. I.

Dorman (Research Inst. of Earth Magnetism

The method of coupling coefficient

evaluation theory of meteor bursts

spectra and the direction of the sources

obtained about the magnetic properties of corpuscular currents; "freezing" of the currents in magnetic fields,

division of currents into two types, one type carrying

($\sim 10^{-5}$ Oe near the earth) magnetic fields related respectively to the high and low latitudinal formations

and comparatively negligible dependence of the

current and the strong dependence of

the degree of

some new data were obtained concerning the turbulent motion of heterogeneities in solar chromospheric eruptions and the values of the magnetic fields "frozen" in them, the general galactic magnetic field, and the distribution of cosmic ray sources in it. (R.V.J.)

DORMAN, L. I.

"Unusual Surge of Cosmic Ray Intensities." Priroda, 45, 85-7, 1956

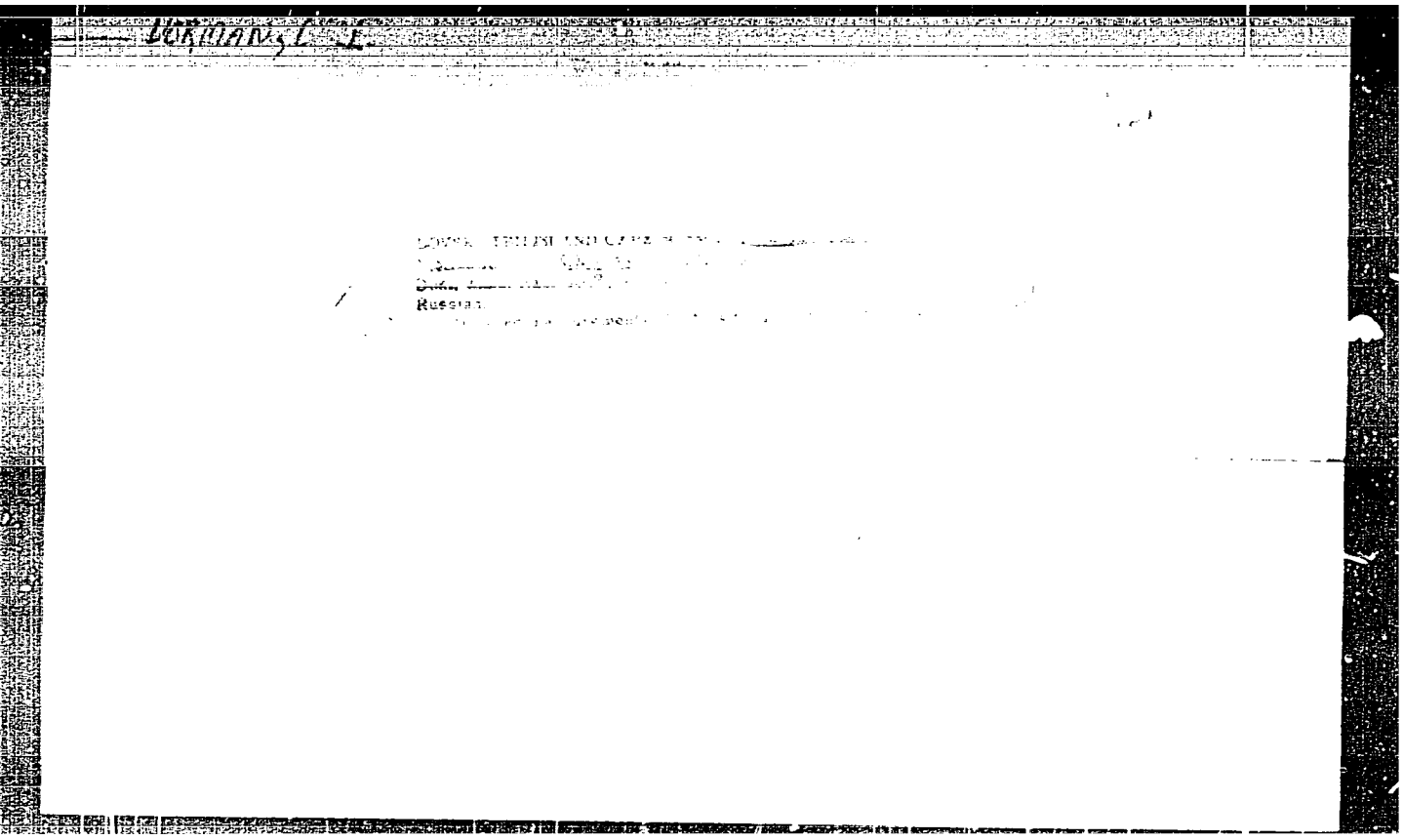
An unusual surge of cosmic-ray intensity was observed Feb. 23 1956. The scale showing the distribution of the cosmic-ray intensities indicate stronger concentration of intensities at higher latitudes (Moscow) and considerable lowering of intensities at the lower latitudes (Japan). The observed surge was 5 to 10 times stronger than the ones observed in 1942 or 1946. The surge of cosmic rays was combined with powerful chromospheric sun eruption and interrupted all short-wave radio communications. It is assumed that the eruption took place on the northwest tip of the sun where a great deal of activity, large number of spots, and chromospheric eruptions we observed before and after the event.

Research Inst. of Earth Magnetism, Ionosphere and Distribution of Radiowaves.

DORMAN, L. I. and FEYNBERG, Ye. L.

"Variations in Intensities of Cosmic Rays." Uspekhi Fiz. Nauk 59, 189-228, 1956.

Variations of cosmic-ray intensities caused by the atmospheric conditions and by acceleration, slowing down, and scattering in the corpuscular streams emmitted by the sun, and by large and small sun eruptions are reviewed. Analyses of various phenomena and methods of study are discussed.



Russian

DORMAN, Leyb Isaakovich; GRIGOROVA, V.A., redaktor; AKHLAMOV, S.N., tekhnicheskiy redaktor

[Variations in cosmic rays] Variatsii kosmicheskikh luchei. Moskva, Gos.izd-vo tekhniko-teoret.lit-ry, 1957. 492 p. (MLRA 10:8)
(Cosmic rays)

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A001/A001

3.1800

Translation from: Referativnyy zhurnal, Astronomiya i Geodeziya, 1959, No. 3, pp. 30-31, # 1902

AUTHOR: Dorman, L. I.

TITLE: Information on Solar Corpuscular Fluxes, Obtained from Studying Variations in Cosmic Radiation

PERIODICAL: V sb.: Fiz. solnechn. korpuskulyarn. potokov i ikh vozdeystviye na verkhnyuyu atmosferu Zemli, Moscow, AN SSSR, 1957, pp. 112-125, Discuss. 125-128

TEXT: The author points out that the study of variations in cosmic radiation makes it possible to obtain information on physical conditions in the interstellar and interplanetary media, on processes on the Sun, and other data of astrophysical nature. The connection between astrophysical and geophysical phenomena (flares on the Sun, magnetic storms, 11-year solar activity cycles, etc.) on the one hand, and changes in the intensity of cosmic radiation, on the other hand, indicates a great role of the Sun in the origin of cosmic rays.

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Information on Solar Corpuscular Fluxes, Obtained from Studying Variations in Cosmic Radiation

However, distortions introduced in the observed variations by changes of meteorological conditions and by contributions of secondary particles originated in the atmosphere, make it difficult to discover the true connection between variations of cosmic radiation and astrophysical factors. At present a method has been developed of excluding meteorological factors. Moreover, a method of "connection coefficients" has been developed which makes it possible to determine variations of the primary flux from the observed variations in secondary components of cosmic rays. The performed analysis of solar-diurnal variations of cosmic radiation, connected with the geomagnetic and solar activities, and its connection with corpuscular fluxes warrant some conclusions on the nature of these fluxes. There exist two types of corpuscular fluxes. The first type fluxes carry comparatively weak magnetic fields ($\sim 10^{-5}$ erg near the Earth), are of low density (a few particles per 1 cm^3 near the Earth) and induce weak and moderate magnetic disturbances on hitting the Earth; on an average, 5-10 fluxes are ejected simultaneously, and this number depends only slightly on the solar activity. The fluxes of this type are due to high-latitude formations on

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Information on Solar Corpuscular Fluxes, Obtained from Studying Variations in Cosmic Radiation

the Sun and are ejected approximately symmetrically with respect to the solar equator. The solar-diurnal variations are connected mainly with the cosmic rays of this type. In the fluxes of the second type the intensity of magnetic field is higher than 10^{-4} - 2×10^{-4} erg, density $\sim 10^3$ cm^{-3}; they give rise to intensive and very intensive magnetic storms on the Earth. The number of second-type fluxes ejected by the Sun is well correlated with Wolf numbers and varies considerably during the cycle of solar activity; these fluxes are connected with low-latitude formations (possibly with sunspots). 27-day variations of cosmic rays, reductions of intensity during magnetic storms, dependence on solar activity, etc. are due to the fluxes of the second type. There are 30 references.

M. I. Fradkin

Translator's note: This is the full translation of the original Russian abstract.

Card 3/3

DORMAN L. I.

AUTHOR: Blokh, Ya. L. and Dorman, L. I. 120-2-13/37

TITLE: Meteorological Coefficients for 4π and 2π Counter Telescopes. (Meteorologicheskiye Koeffitsiyenty dlya Kubicheskogo i Polukubicheskogo Teleskopov.)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.2, pp. 46 - 48 (USSR).

ABSTRACT: Complex telescopes for continuous registration of the cosmic rays intensity will be extensively used during the coming I.G.Y. The author determines the theoretical values of the barometric pressure coefficient and of the temperature coefficient which can be used with cubical telescopes at the sea level and to the semi-cubical telescopes under the surface of the earth, at depths of 25 and 55m of the water equivalent. The use of these coefficients will free experimental data from the distorting influence of the varying meteorological conditions. According to the theory (Ref. 1) the relative change

$$\delta N_\mu / N_\mu = \alpha_{bar} \delta h_o + \int_0^{h_o} W_t(h).\delta T(h)dh,$$

of μ-mesons intensity due to a relative barometric change δh_o at the observation level and the relative temperature

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Meteorological coefficients for 4π and 2π Counter Telescopes.

change $\delta T(h)$ is given by eq.(1). This expression has two coefficients a_{bar} - atmospheric pressure coefficient in %/millibar and $W_T(h)$ - density of the temperature coefficient in $\%/1^{\circ}C$ atm. Both coefficients can be determined from the two equations (2), where $W_T(h,\varepsilon)$ and $a_{bar}(\varepsilon)$ are the meteorological coefficients for directed intensities. The values of $W_T(h,\varepsilon)$ for subterranean measurements were obtained in Ref.2 and for the sea level measurements in Ref.3. Results of a calculation of $a_{bar}(\varepsilon)$ are given in the form of a graph (Fig.2) for various assumed values of the effective index n of the differential spectrum of π-meson production. Using $a_{bar}(\varepsilon)$ and $W_T(h,\varepsilon)$ as defined in eq.(2), the required coefficients are presented graphically in Figs. 3 and 4 (cf. Ref.2). The meteorological coefficients should not depend in practice on the latitude of the observation point, nor on the local climatic conditions. Six graphs of numerical

Meteorological coefficients for 4π and 2π Counter Telescopes. 120-2-13/37

reference are given. There are 7 references, 5 of which are Slavic.

SUBMITTED: November 3, 1956.

ASSOCIATION: Scientific and Research Institute of Terrestrial Magnetism, of the Ionosphere and of Radiowave Propagations. (Nauchno-Issledovatel'skiy Institut Zemnogo Magnetizma, Ionosfery i Rasprostraneniya Radiovoln.)

AVAILABLE: Library of Congress.

Card 3/3

DORMAN, L.I.

see card 4-6 PHASE I BOOK EXPLOITATION 881

Akademiya nauk SSSR. Yakutskiy filial

Variatsii intensivnosti kosmicheskikh luchey (Variations of the Intensity of Cosmic Rays) Moscow, Izd-vo AN SSSR, 1958. 168 p. (Series: Its: Trudy, seriya fizicheskaya, vyp. 2) 1,500 copies printed.

Resp. Ed.: Shafer, Yu.G., Candidate of Physical and Mathematical Sciences; Ed. of Publishing House: Fradkin, M.I.; Tech. Ed.: Pavlovskiy, A.

PURPOSE: This collection of articles is for scientists and students of cosmic rays and meteorology.

COVERAGE: This issue contains articles on experimental methods in the continuous registration of cosmic rays, the investigation of meteorological effects of the different components of cosmic rays, and the connection between variations in cosmic ray intensity and solar and magnetic activity. Part I describes apparatus used in

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measuring cosmic ray intensity on and under the earth's surface and in the upper layers of the atmosphere, and specifically discusses the ASK automatic ionization chamber. Part II discusses the theory, methods and results of the investigation of meteorological effects of the various components of cosmic rays. Part III discusses the characteristics of daily variations in cosmic ray activity. The following scientists are mentioned in the introduction: S.N.Vernov, Corresponding Member of the AS USSR, Professor Ye.L.Feynberg, and N.L.Grigorov, Doctor of Physical and Mathematical Sciences. The articles are accompanied by diagrams, tables, and bibliographic references.

TABLE OF CONTENTS:

PART I. APPARATUS FOR MEASURING VARIATIONS OF INTENSITY OF COSMIC RAYS

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AVAILABLE: Library of Congress

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Card 6/6

DORMAN, L.I.

P.3

PHASE I BOOK EXPLOITATION SOV/3762

Konferentsiya po magnitnoy gidrodinamike. Riga, 1958.

Voprosy magnitnoy gidrodinamiki i dinamiki plazmy; trudy Konferentsii. (Problems in Magnetohydrodynamics and Plasma Dynamics; Transactions of a Conference) Riga, Izd-vo AN Latviyskoy SSR, 1959. 343 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Akademiya nauk Latviyskoy SSR. Institut fiziki.

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PURPOSE: This book is intended for physicists working in the field of magnetohydrodynamics and plasma dynamics.

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Problems in Magnetohydrodynamics (Cont.) SOV/3762

COVERAGE: This volume contains the transactions of a conference held in Riga, June 1958, on problems in applied and theoretical magnetohydrodynamics. The objects of the conference were the investigation of the basic trends in theoretical and applied magnetohydrodynamics, establishing contact between the people doing research in different branches of magnetohydrodynamics, and promoting the participation of theoretical physicists in problems in applied magnetohydrodynamics. More than 160 persons from different parts of the Soviet Union took part in the conference, and 55 papers were read. Similar conferences are to be held regularly in the future; the next such conference is scheduled to be held in Riga in June 1960. In this present collection of the transactions of the conference, most of the papers and comments on papers are presented by the authors themselves in an abridged form. The book is divided into two parts: the first part deals with problems in theoretical magnetohydrodynamics and plasma dynamics, and consists of 35 articles on such aspects of the problem as the application of magnetohydrodynamics in astrophysics (D.A. Frank-Kamenetskiy), magnetohydrodynamics and the investigation of cosmic-ray variations (L.I. Dorman), acceleration of plasma in a magnetic field (G.V. Gordeyev and A.I. Gubanov), stability of shock waves and magnetohydrodynamics (A.I. Akhiyezer). The second part, consisting of 33 articles, deals with problems of experimental magnetohydrodynamics, including the application of physical simulation for investigation of electromagnetic processes in liquid metals (I.M. Kirko) and the development of electromagnetic pumps (P.G. Kirillov), at the Institute of Physics of the

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Academy of Sciences, Latvian SSR. Several articles are devoted to induction pumps, electromagnetic crucibles, electromagnetic stirrers for molten metals, and their application in the metallurgical industry including schematic diagrams of their power-supply systems. References are given at the end of most of the articles.

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Voprosy Magnitnoy Gidrodinamiki i Dinamiki Plazmy. Trudy Konferentsii Po Magnitnoy Gidrodinamike, Riga, 2-10 Iyulya 1958 g. (Problems of Magnetohydrodynamics and Plasma Dynamics. Works of the Conference On Magnetohydrodynamics, Riga, 2-10 July 1958), Riga, 1959, 339 pp

The majority of the texts of the 55 conference reports and discussions of reports are presented in the source in abridged form. Previously published reports are included there as brief abstracts only. The material published there for the first time (abridged and unabridged) are as follows:

"The Role of Magnetohydrodynamics and Plasma Dynamics in Certain Problems of Astrophysics," by D. A. Frank-Kamenetskiy, Moscow, pp 7-11

"Magnetohydrodynamics and the Study of Variations of Cosmic Rays," by L. I. Dorman, Moscow, pp 13-44

"Cosmic Ray Spectra and Their Role in Cosmic Gas Dynamics," by S. I. Syrovatskiy, Moscow, pp 45-48

"The Influence of a Magnetic Field on the Stability of Flow of a Conducting Fluid," by Ye. P. Velikhov, Moscow, pp 49-58

"Some Problems of the Motion of a Rarefied Plasma in a Magnetic Field," by Ya. P. Terletskiy, Moscow, pp 59-62

"On Nonlinear Steady-State Motions of a Rarefied Plasma in a Magnetic Field," by R. Z. Sagdeyev, Moscow, pp 63-65

"On One Criterion of Applicability of the Equations of Magnetohydrodynamics to a Plasma," by S. I. Braginskiy, Moscow, pp 67-71 (Discussion of the report by R. V. Polovin, Khar'kov, pp 71-72)

"On the Possibility of Accelerating Charged Particles by Means of Shock Waves in a Magnetized Plasma," by L. I. Dorman and G. I. Freydman, Moscow and Gor'kiy, pp 77-81

"On an Acceleration of Charged Particles During Powerful Impulse Discharges and During the Collision of Magnetized Clouds," by L. I. Dorman, Moscow, pp 83-88

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"On Magnetic Boundary Layers and Electric Current Discharges in Moving Media," by V. N. Zhigulev, Moscow, pp 185-190

DORMAN L. I.

"CONCERNING THE ENERGY SPECTRUM OF THE VARIATIONS AND DURATION OF THE INCREASE EFFECT PRECEDING MAGNETIC STORMS"
L. I. Dorman

To explain the effect of cosmic ray intensity increases preceding magnetic storms, a mechanism of accelerating particles by a shock wave formed by the front edge of the solar corpuscular stream is suggested. The shock wave is propagated in interplanetary space with a velocity of approximately 1.3 times that of the stream and reaches the Earth earlier than the stream. It is therefore a sort of "forerunner" of the magnetic storm.

Calculations are made of the energy spectrum of the particles evoking the increase effect and of the duration of this effect. It is shown that with decrease in rigidity of particles the amplitude of this effect should increase and the duration should decrease. Thus, the expected duration of the effect for particles with a rigidity of 3.10^{10} ev/c is approximately 8 hours; it is about 20 minutes for particles with a rigidity of 10^{9} ev/c, and approximately 2 minutes for particles with a rigidity of 10^{8} ev/c (in the latter case, the amplitude of the effect should be quite appreciable and approach 100%). By means of correlation coefficients, calculations are made of the expected variations of different components at different latitudes. A preliminary comparison of the obtained results and the experimental data is made, and other possible explanations of this effect are discussed.

report presented at the International Cosmic Ray Conference, Moscow, 6-11 July 1959

DORMAN L.I.

"THE POSSIBILITY OF PRE-ACCELERATION OF COSMIC RAYS BY THE PINCH EFFECT MECHANISM"
L.I.Dorman

A model of charged particle acceleration between two approaching half-spaces with "frozed" magnetic fields is considered. Assuming the absence of magnetic field between the half spaces, the law of energy change with time is detwemined, as well as the maximum relative acceleration as a function of initial particle momentum, the distance between the half spaces and the intensity of the "frozed" magnetic field.

An evaluation is made of the conditions of injection, the acceleration of particles with different Z is compared and the energy spectrum for the acceleration from thermal energies with initial Maxwell distribution is determined. The variations in the results a e evaluated for the case when the discussed model is generalized to cover real magnetic cloud collisions and pinch effect in the plasma. On the basis of A. B. Severny's observarions, and on results, the significance of the mechanism considered is discussed for per-acceleration of particles in solar flares and supernovae and also for collisions of magnetized clouds (in particular for collisions of galaxies). The assumption is made that further acceleration of particles to higher energies is accomplished by Fermi's atatistical mechanism.

report presented at the International Cosmic Ray Conference, Moscow 6-11 July 1959