SALOMATINA, Yu.

KRAVCHENKO, I., kandidat tekhnicheskikh nauk; SALOMATINA, Yu., inzhener

Cement for reinforced concrete products made using steam curing. Stroi.mat. izdel. i konstr. 1 no.4:21-23 Ap'55. (MLRA 8:10)
(Cement)

SOKHATSKAYA, G.A., kandidat tekhnicheskikh nauk; SALOMATINA, Yu.F., kandidat tekhnicheskikh nauk.

Experience of the "Komsomolets" cement factory in increasing the durability of rotary kiln linings. TSement 23 no.2:13-18 Mr-Ap '57. (MIRA 10:7)

(Kilns, Rotary)

PIROGOV, A.A.; LEVE, Ye.N.; SOKHATSKAYA, G.A.; SALOMATINA, Yu.F.

Testing the lining of the clinkering zone in rotary klins by unfired products of magnesia concrete, Sbor.nauch.trud. UNIIO no.5:234-253 '61. (MIRA 15:12)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov (for Pirogov, Leve). 2. Gosudarstvennyy vsesoyuznyy nauchno-issledovatel'skiy institut tsementa (for Sokhatskaya, Salomatina).
(Kilns, Rotary) (Magnesia cement)

SHORYGINA, N.N.; IZUMRUDOVA, T.V.; ADEL', I.B.; ZAGARMISTR, O.S.; SALOMATINA, Z.T.

Prospects for the use of hydrolytic lignin in the protroleum industry. Gidroliz. i lesokhim. prom. 14 no. 1:5-6 '61. (MIRA 14:1)

(Lignin) (Petroleum industry)

SALOMATOV, A.D.; PODVYAZKIN, Yu.A.

Laboratory apparatus for shaking. Soob. DVFAN SSSR no.17:49-51 '63.
(MIRA 17:9)

1. Dal'nevostochnyy filial im. V.L. Komarova Sibirskogo otdeleniya AN SSSR.

SALOMATOV, N.A., inzh.

Automatic welding in a carbon dioxide atmosphere. Svar. proizv. no.3:33-34 Mr '62. (MIRA 15:2)

1. Sibirskiy zavod tyazhelogo mashinostroyeniya.
(Electric welding) (Protective atmospheres)

SOV/136-58-6-13/21

AUTHORS: Donchenko, P.A., Novozhilov, A.B. and Salomatov, N.K.

TITLE: Mastering the Slag-fuming Installation at the Ust'-Kamenogorsk Lead-zinc Combine (Osvoyeniye shlakovozgonochnoy ustanovki na Ust'-Kamenogorskom svintsovo-tsinkovom kombinate)

PERIODICAL: Tsvetnyye Metally, 1958, Nr 6, pp 74 - 82 (USSR)

ABSTRACT: The slag-fuming installation at the lead works of the Ust'-Kamenogorsk Combine was started in January 1956, having been built to the imperfect designs of the Giprotsvetmet. The authors briefly describe the installation and the improvements made in the design of individual units and outline operating results. The installation (Figure 1) consists of a fuming furnace fired with a coal-air mixture. An electrically heated settler for separating matte from slag, waste-heat boilers, sleeve filters, coal pulverisation section and air blowers. The furnace (Figure 2) is a rectangular shaft (internal hearth dimensions 2.107 x 3.12 m, height 5.3 m) with a capacity of 26 tons of slag (1.5% Pb, 12.8% Zn, 0.8% Cu). The fume amounts to 19% of the slag weight and contains 7.5% Pb, 60% Zn (Zn and Pb recovery 82 and 97%, respectively). The coal

Card 1/3

SOV/136-58-6-13/21

Mastering the Slag-fuming Installation at the Ust'-Kamenogorsk Lead-zinc Combine

used is Prokop'yevsk (calorific value 6 800 cal/kg, 15.8% ash), ground with a type SM-18 hammer mill and crushed with a type Sh-10 mill; the dust is passed through a system of bunkers and injected with the aid of feeders of the type used at the Podol'sk Tin Works. The settler (Figure 3) is lined with chrome-magnesite and fire-clay bricks and has three graphite electrodes fed by three type EPOM-250 transformers giving a current of 2 500 - 3 000 A. The waste-heat boiler type UKTsM 15/40 was specially designed by Giprotsvetmet and reduces gas temperature from 1 200 - 350 °C. Experience showed that the original cast-iron furnace ports were unsatisfactory, the receiver of the filling runner was too small, the combustion of gases was completed in the waste-heat boiler. The Kazgiprotsvetmet-designed settler was also found to be unsatisfactory in most respects and the dust-catching arrangements were insufficient. To find optimal operating conditions tests were carried out jointly by the VNIItsvetmet Institute, the experimental shop of the combine and personnel of the fuming department (table).

Card 2/3

SOV/136-58-6-13/21

Mastering the Slag-fuming Installation at the Ust'-Kamenogorsk Lead-zinc Combine

The dependence of the metal contents on duration of blowing of the metal contents in the slag (Figure 4), of metal concentrations in the fume (Figure 5) and of gas dust contents (Figure 6) were among the factors studied. In spite of its original failings, the adoption of the installation has proved profitable; oxygen-enrichment of the blast should improve efficiency further.
There are 6 figures and 1 table

ASSOCIATION: UKSTsK

Card 3/3

ONAYEV, I.A.; KUROCHKIN, A.F.; TONKONOGIY, A.V.; SALOMATOV, N.K.

Overall processing of Balkhash copper concentrates by the cyclone method. Vest. AN Kazakh. SSR 20 no.2:42-49 F '64.

(MIRA 18:1)

KERSHANSKIY, I.I.; ROZLOVSKIY, A.A.; SALOMATOV, N.K.; KERSHANSKAYA, L.N.;
AFASHAGOV, Yu.M.; KUUR, V.P.

Pilot plant tests in precipitation reduction smelting of antimony concentrates in electric furnaces. TSvet. met. 38 no.5:34-41 My '65.
(MIRA 18:6)

SALOMATIN, Yu.V., inzh.

Modernized starting val'e with pneumatic control. Bezop. truda v prom. 7 no.12:28-29 D '63. (MIRA 18:7)

1. Kuybyshevskiy nauchno-issledovatel'skiy institut neftyanoy promyshlennosti.

SALOMATOV, V.V.; BOYKOV, G.P.

Initial period of heating solids by radiation with a variable temperature of the heat source. Izv. vys. ucheb. zav.; chern. met. 6 no.12:177-181 '63. (MIRA 17:1)

1. Tomskiy politekhnicheskiy institut.

IVANOV, V.V.; SALOMATOV, V.V.

Use of substitutions in solving boundary value problems in heat conduction theory. Izv. TPI 125:54-57 '64. (MIRA 18:8)

L 63911-65 EWT(1)/EPF(c)/EPF(n)-2/EWG(m) WW

ACCESSION NR: AR5018967 UR/0044/65/000/007/B071/B071

517.9:536.2

23

B

SOURCE: Ref. zh. Matematika, Abs. 7B344

AUTHOR: Salomatov, V. V.; Boykov, G. P.

TITLE: Heating of bodies in a radiation medium with variable temperature

21

CITED SOURCE: Izv. Tomskogo politekhn. in-ta, v. 125, 1964, 58-66

TOPIC TAGS: boundary value problem, heat conductivity

TRANSLATION: A boundary value problem for a one-dimensional heat equation is studied for the case when one of the boundary conditions is homogeneous of the second kind and the other is nonlinear (defining heating of a body in a radiating medium). The given boundary value problem is linearized, and an integral Laplace transform is used to solve the resulting linear problem. Solutions are exhibited (in the form of infinite series) for an unbounded plate, a cylinder, and a sphere in the case of exponentially changing temperatures in the external medium. A. Uspenskiy

SUB CODE: TD, MA ENCL: 00

Card 1/1

L 22473-66 EWT(d)/EWT(l)/EWT(m)/EPF(n)-2/EWG(m)/T/EWP(t) IJP(c) JD/WW

ACC NR: AP6009147 SOURCE CODE: UR/0139/65/000/005/0086/0089

AUTHOR: Salomatov, V. V.

ORG: Tomsk Polytechnic Institute im. S. M. Kirov (Tomskiy politekhnicheskiy institut)

61
B

TITLE: Temperature field in a crystal heated by radiation

SOURCE: IVUZ. Fizika, no. 5, 1965, 86-89

TOPIC TAGS: temperature distribution, crystal growing, heat conduction, radiative heat exchange, heat equation, crystal

ABSTRACT: The author presents an exact solution of the problem of determining the temperature field in a crystal on whose surface heat exchange takes place by radiation and whose thermophysical characteristics depend on the temperature. Such a calculation is of importance for the growth and annealing of crystals, when it is desired to avoid surface and volume defects due to uneven temperature. The problem consists of solving the nonstationary heat-conduction equations

L 22473-66

ACC NR: AP6009147

$$C\rho\frac{\partial T}{\partial \tau} = \operatorname{div}(\lambda \operatorname{grad} T),$$

$$T(x, 0) = f_1(x),$$

$$\frac{\partial T(0, \tau)}{\partial x} = 0,$$

subject to the boundary condition

$$\lambda\frac{\partial T(R, \tau)}{\partial x} + \sigma T^4(R, \tau) = q_e(\tau).$$

(standard notation). The solution is solved by an integral-transformation method. Several particular cases are considered (constant initial temperature and constant radiant-heat source, linear variation of radiator temperature, exponential variation of the radiating medium). The equations obtained include the region of temperature below the Debye temperature. Orig. art. has: 14 formulas.

SUB CODE: 20/ SUBM DATE: 25Apr64/ ORIG REF: 003/ OTH REF: 004

Card 2/2 BK

SALOMATOV, V.V.; BOYKOV, G.P.

A radiant heat flux due to the heating of bodies by a source of variable temperature. Inzh.-fiz. zhur. 8 no.3:369-374 Mr '65. (MIRA 18:5)

1. Politekhnicheskiy institut imeni Kirova, Tomsk.

BUSTEA, Maria, dr.; DABIJA, Viorica, dr.; GHEORGHE, Ileana, dr.; IONESCU, E., dr.; IONESCU, Zenobia, dr.; LUNGU, Felicia, dr.; SALOMIN, Nadia, dr.; SAVIN, Valentina, dr.; STANESCU, I., dr.; STOICA, V., dr.; SERBAN, N., dr.; VISAN, Valeria, dr.

Our results in the treatment of complications of dental caries. Stomatologia (Bucur) 12 no.1:9-16 Ja-F'65.

1. Colectivul Serviciului de stomatologie al Spitalului unificat de adulti, Constanta.

SALOMON, Ervin, ing.; FISER, Ivan, ing.

Electrical industry of Yugoslavia. Alm metal ind 45-65 '60.

1. Drzavni savetnik u Saveznom zavodu za privredno planiranje (for Salomon). 2. Savetnik u Saveznom zavodu za privredno planiranje (for Fiser)

SALOMON, M.

Calculating constants of substitute static systems with transport lag from the results of measurements using a general form signal. p. 292.

AUTOMATIZACE. Praha, Czechoslovakia. Vol. 2, no. 10, Oct. 1959.

Monthly list of East European Accessions (EEAI) LC, Vol. 9, no. 1, January 1960.

Uncl.

SALOMONOVICH, A.Ye. CAND PHYSICOMATH SCI.

Dissertation: "Dry Friction and Electrical Contact at Small Displacements."

14 March 49
Physics Inst imeni P.N. Lebedev, Acad Sci USSR.

SO Vecheryaya Moskva
Sum 71

SALOMONOVICH, A. 177T34

USSR/Electronics - Counters Nov 50
Thyratrons

"Radio Engineering in the Service of Modern Physics,"
A. Salomonovich

"Radio" No 11, pp 23-26

Describes use of oscilloscope and secondary-electron multipliers by N. A. Tolstoy and P. P. Feofilov to study extinguishing of luminophors. Gives examples of how linear amplifiers, thyratrons, and trigger circuits can be used in countercircuits. Graphically illustrates operating principle of coincidence counter.

[redacted] 177T34

SALOMONOVICH, A Ye.

168T92

USSR/Physics - Friction, Dry
Contact, Electrical

Jul 50

"Dry Friction and Electric Contact for Small Displacements," A. Ye. Salomonovich, Phys Inst imeni Lebedev, Acad Sci USSR

"Zhur Eksper i Teoret Fiz" Vol XX, No 7, pp 647-660

Discusses dynamic method for experimentally investigating mechanical force of interaction and behavior of electric contact for small displacements of touching solids. Gives new results obtained by this method. Submitted 8 Jan 50.

168T92

SA

A 53
H

534.152 : 535.417

8590. **Measurement of the amplitude of vibration of piezoelectric crystals by an interference method.** L. N. Borodovskaya and A. E. Salomonovich. *J. Tech. Phys., USSR,* 21, 221-4 (Feb., 1951) *In Russian.*

A Zeiss interference comparator was used for measuring the amplitude of the vibration of quartz crystals along the *Y* axis for frequencies of 75-160 kc/s. This comparator was a Michelson interferometer in which one of the mirrors served as the fixed polished surface of a wedge, the other polished surface of the wedge being the face of the quartz crystal under investigation; the wedge between the two surfaces was air filled. The wedge interference pattern obtained was viewed through an eyepiece fitted with a camera for photographing the pattern. Using this apparatus it was possible to graduate a control apparatus in absolute units in terms of the mechanical displacement of the faces of the piezo quartz crystal, and to establish a linear relation between the applied voltage and the mechanical displacement. The relation between the normal and tangential displacement of any face of the crystal could also be established.

W. Hughes

METALLURGICAL LITERATURE CLASSIFICATION

KOBELEV, V.; SALOMONOVICH, A.

Wave Guides

Wave conductors. Radio no. 2, 1952.

Monthly List of Russian Accessions, Library of Congress, April 1952. UNCLASSIFIED.

SALOMONOVICH, A. Ye.

USSR/Electronics - Selfmodulation Feb 52

"Self-Modulation in Ferro Resonance," A. Ye. Salomonovich, Inst of Phys imeni Lebedev, Acad Sci USSR

"Zhur Tekh Fiz" Vol XXII, No 2, pp 245-258

Analyzes case in which circuit characteristics are nearly linear and variations of amplitude and phase are slow in comparison to period of external force. Considers particular cases in which ohmic resistance or capacitance of circuit depend on temp. Indebted to Prof S. M. Rytov. Received 1 Jul 51.

209T59

SALOMONVICH, A.

USSR/Electronics - Wave Guides Mar 52

"Wave Guides in Superhigh-Frequency Techniques," A. Salomonovich

"Radio" No 3, pp 16-20

General discussion of subject under the following headings: excitation of wave guides and removal of energy from them, matching in wave guides, connection of wave guides, and application of wave guides. Claims that Ya. N. Fel'd developed the theory of the slot antenna and the M. S. Neyman 1st proposed cavity resonators.

229T62

SALOMONOVICH, A. YE.

USSR/Electronics - Nonlinear Capacitance, Subharmonics Jul 52

"Division of Frequency in a Circuit With a Nonlinear Condenser," A. Ye. Salomonovich, Phys Inst imeni Lebedev, Acad Sci USSR

"Zhur Tekh Fiz" Vol XXII, No 7, pp 1190-1194

In the case of division of frequency due to a nonlinear variable capacitance a combination of parametric generation with a type of ferro-resonance occurs. The presence of reactive nonlinearity is necessary for the generation of half-frequency. Received 10 Feb 52.

223T41

SALOMONOVICH, A.

USSR/Electronics - Radioastronomy Aug 52

"Radioastronomy," A. Salomonovich, Cand Phys-Math Sci

"Radio" No 8, pp 22-26

Describes antennas and receivers used in radioastronomy. Observations by S. E. Khaykin and B. M. Chikachev in 1947 showed that solar radio emission in the meter-wave band comes from the upper layers of the solar corona. V. L. Ginzburg,

226T25

V. V. Vitkevich, and I. S. Shklovskiy are also active in this field; the latter predicted the "bright-line" (21-cm) emission of gaseous hydrogen in interstellar matter several years before it was discovered.

226T25

PA 240T76

SALOMONOVICH, A. YE.

USSR/Electronics - Nonlinear Detector Dec 52

"Investigations of Dependence of a Nonlinear Crystalline Detector on Small Shifts of the Contact Needle," N. V. Karlov and A. Ye. Salomonovich

"Zhur Tekh Fiziki" Vol 22, No 12, pp 1981-1984

Investigate variation of detector behavior at shifts of order of 10^{-4}cm. Use for measurements dynamic method applied previously (DAN, 70, 4, 1950). Results show that nonlinear properties of detector depend on variation of gap size in similar manner as in case of gap between metals. Received 25 Jul 52.

240T76

SALOMONVICH, A.

Chto takoe radioastronomiia /What is radio astronomy/. Moskva, Goskul'tprosvetizdat, 1953. 80 p.

SO: Monthly List of Russian Accessions, Vol. 7, No. 3, June 1954.

SALOMONOVICH, A. E.

I-12

Category : USSR/Radiophysics - Application of radiophysical methods

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1978

Author : Salomonovich, A.Ye., Shmaonov, T.A.

Title : Concerning the Problem of the Choice of the Modulation Frequency in a Modulation Radiometer

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955. M., AN SSSR, 1956, 127-129 diskus. 130

Abstract : The maximum value of the modulation frequency is determined by the width of the anomalous noise spectrum at the output of the second detector of the receiver. A spectrum analyzer for the investigation of this spectrum was built, using a heterodyne circuit with a quartz filter at the intermediate frequency. The resolving power of the analyzer is 6 cycles, the range of the investigated frequencies is from 10 to 1000 cycles. The investigation was made on a wide-band 3.2-meter superheterodyne receiver with a crystal mixer and a klystron heterodyne. The i-f amplifier had a bandwidth of 15 Mc at 60 Mc and employed 6Zh1P and 6Zh2P tubes (a total of 18). The overall gain was 10^6. Measurements have shown that when the set was fed from batteries, no anomalous spectrum was observed above 30 cycles. When the receiver was fed from the power line, regardless of the satisfactory quality of the stabilized rectifiers and the good filtering, the anomalous spectrum has bumps at 50, 100, and 150 cycles.

Card : 1/1

KARLOV, N.V.; SALOMONOVICH, A.Ye.

Application of ferrites in radioastronomy technique. Radiotekh.i elektron. 1 no.1:120-121 Ja '56. (MLRA 9:11)

1. Fizicheskiy institut imeni P.N. Lebedeva Akademii nauk SSSR.
(Radio astronomy) (Ferrite(Steel constituent))

KARLOV, N.V.; SALOMONOVICH, A.Ye.

Automatic null-type centimeter-wave radiometer for investigation of weak noise signals. Radiotekh.i elektron. 1 no.1:121-122 Ja '56.
(MLRA (9:11)

1. Fizicheskiy institut imeni P.N.Lebedeva Akademii nauk SSSR.
(Radiometer) (Radio astronomy)

SALOMONOVICH, A. Ye.

KARLOV, N.V.; SALOMONOVICH, A.Ye.

Automatic zero radiometer used for measurements at 3,2 cm.wavelengths. Prib.i tekh.eksp.no.2:105-108 S-O '56. (MLRA 10:2)

1. Fizicheskiy institut im.P.N.Lebedeva AN SSSR.
(Radiometer)

Salomonovich, A.E.

2/

56. N. V. KARLOV, A. E. SALOMONOVICH: Automatic null radiometer at 3.2 cm (FIAN USSR)

Abstract: The development is described of an automatic null radiometer of the centimeter band intended to investigate [illegible]. A horn antenna directed toward the zenith with a [illegible] attenuator [illegible] [illegible] the shaft of the [illegible] is the output of [illegible] meter with the error signal [illegible]. The radiometer [illegible] antenna [illegible] regulation [illegible]

RADIOTEKHNIKA I ELEKTRONIKA, Vol 1, Nr 6, 1956, p 886

26-58-4-41/45

AUTHOR: Salomonovich, A.Ye., Candidate of Physico-Mathematical Sciences (Moscow)

TITLE: An Important Method of Studying the Universe (Vazhnyy metod izucheniya vselennoy)

PERIODICAL: Priroda, 1958, Nr 4, pp 118-119 (USSR)

ABSTRACT: This is a critical review of the book "Radioastronomy" written by I.S. Shklovskiy and published in 1955 by Gostekhizdat. The book, written in a popular style, acquaints the average reader with the principal methods of radio-astronomical observations, of cosmic radio emission, radio location of the moon, etc. The brochure "New Facts About Radioastronomy", written by the same author, was published in 1957 and is a supplement to the above-mentioned book. It covers recent discoveries in the field.

AVAILABLE: Library of Congress

Card 1/1

1. Radio astronomy-USSR 2. Radio astronomy-Applications

SOV/58-59-5-11397

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 5, p 213 (USSR)

AUTHORS: Amenitskiy, N.A., Li Tsin-fan', Salomonovich, A.Ye., Khangil'din, U.V., Chen Tszyun-lyan

TITLE: Observations of 8-mm Wavelength Solar Radio Emission During the Annular Eclipse of 19 April 1958

PERIODICAL: Solnechnyye dannyye, 1958, Nr 7, pp 69 - 71

ABSTRACT: A joint expedition of the Academies of Science of the USSR and CPR carried out observations of the total flux and circularly-polarized component on Lake Hainan (CPR) with the aid of a radiotelescope built by the Physical Institute of the AS USSR. This instrument has a $\sim$60' radiation pattern at 0.5 power. The authors submit the temperature-variation curve of the antenna fixed on the sun, as well as the data resulting from the preliminary processing of this curve. The sun's brightness temperature on the day of the eclipse was 7,900$\pm$400°K. The residual antenna temperature during the maximum phase amounted to 17$\pm$0.5% of the temperature of the uneclipsed sun (it would be 11% in the case of uniform brightness distribution on the

Card 1/2

SOV/58-59-5-11397

Observations of 8-mm Wavelength Solar Radio Emission During the Annular Eclipse of 19 April 1958

sun's disk at a diameter of 32'). The radiation flux connected with spot group Nr 188 (observed on longer wavelengths) did not exceed 2% of the flux of the entire disk. With an accuracy approaching 0.2% of the total flux, no change was detected in the circularly-polarized component during the closing and opening of the spot group (the flux of circularly-polarized radiation did not exceed 3.5×10^{-22} W/m^{2}c). The authors advance hypotheses concerning the causes of the observed residual radiation. (Fiz. in-t AS USSR).

A.S.

Card 2/2

AUTHOR: Salomonovich, A. Ye. 30-58-5-31/36

TITLE: A New Powerful Radiotelescope (Novyy moshchnyy radioteleskop).
Building Activity in the Serpukhov Station of the Physics Institute (Stroitel'stvo na Serpukhovskoy stantsii Fizicheskogo Instituta)

PERIODICAL: Vestnik Akademii Nauk SSSR, 1958, [illegible], Nr 5, pp. 130-131 (USSR)

ABSTRACT: This telescope has a diameter of 22 m. Its design was worked out under the direction of experts of the institute by a number of organizations. It represents a metallic rotating paraboloid with a distance of foci of 9.5 m. By means of an electrical drive it can practically be adjusted to any point of the hemisphere. Radio waves of the sun, the moon, the planets, the radio nebulae and of interstellar hydrogen can be investigated by it. At present the radiotelescope is mounted and it shall be taken into operation in the current year.

Card 1/1

1. Radio astronomy--USSR 2. Radio astronomy--Equipment

SALOMONOVICH, A.Ye.

Radiowave emission of the moon in the 8 mm wavelength [with summary in English]. Astron. zhur. 35 no.1:129-136 Ja-F '58. (MIRA 11:3)

1. Fizicheskiy institut im. P.N. Lebedeva AN SSSR.
(Moon--Temperature and radiation) (Radio astronomy)

SOV/33-35-4-18/25

3(1)

AUTHORS: Salomonovich, A.Ye., Pariyskiy, Yu.N., Khangil'din, U.V.

TITLE: Observations in the Millimeter Diapason of the Total Solar Eclipse of June 30, 1954 (Nablyudeniye polnogo solnechnogo zatmeniya 30 iyunya 1954 g. v millimetrovom diapazone voln)

PERIODICAL: Astronomicheskiy zhurnal, 1958, Vol 35, Nr 4, pp 659-661 (USSR)

ABSTRACT: The observations were carried out in the neighbourhood of Novo-Moskovsk (Ukr.SSR) during an expedition of the Physical Institute imeni P.N.Lebedev of the Academy of Sciences of the USSR. The authors thank Ye.K.Karlova for the preparation of the apparatus and for the assistance during the performance of the observations.
The reduction of the eclipse curve enabled the estimation of the height of the effective layer of emission above the photosphere ($6 \cdot 10^3$ km $\pm 30\%$) and the distribution of radio brightness on the solar disk. The comparison of the eclipse curve with the curves of Troitskiy, Zelinskaya, Rakhlin and Bobrik [Ref 4] who observed there the solar eclipse in the centimeter range, shows a coincidence of some details.

Card 1/2

Observations in the Millimeter Diapason of the Total Solar Eclipse of June 30, 1954 SOV/33-35-4-18/25

There are 2 figures, and 4 references, 1 of which is Soviet, and 3 are American.

ASSOCIATION: Fizicheskiy institut imeni P.N.Lebedeva AN SSSR (Physical Institute imeni P.N.Lebedev AS USSR)

SUBMITTED: May 30, 1957

Card 2/2

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446910010-5"

AUTHORS: Vitkevich, V. V., Kuz'min, A. D., Salomonovich, A. Ye., Udal'tsov, V. A. 20-118-6-11/43

TITLE: A Radio Image of the Sun on 3,2 cm Wave Length (Radioizobrazheniye Solntsa na volne 3,2 cm)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 6, pp. 1091-1093 (USSR)

ABSTRACT: In July, 1957, the construction of a new great radiotelescope which consists of a stationary parabolic reflector with a diameter of 31 m was begun on the Crimean station of the Institute of Physics imeni P. N. Lebedev of the Academy of Sciences of the USSR (Krymskaya stantsiya Fizicheskogo instituta im. P. N. Lebedeva AN SSSR). The geometric axis of the paraboloid is inclined by + 22° in the meridian plane which facilitates the annual observation of the radio radiation of the sun in June-July. In July, 1957, the investigation of the two-dimensional distribution of the intensity of the radio radiation over the sun disk was started on the wave lengths 3,2 and 10 cm. For this work the radio-spectrometers worked out by A. Y. Salomonovich and

Card 1/3

A. D. Kuz'min were used. The occurring signal was modulated by means of ferrites and circular wave guides. The carrying-out of the measurements is discussed in short. These measurements made possible the recording of the curves of the distribution of intensity of the radio radiation over the sun disk, i.e. on a series of subsequent strips the orientation of which approaches the north-south direction. The totality of these curves permits the construction of a two-dimensional image of the distribution of the radio brightness. The small width of the diagram on the wave 3,2 cm makes possible the detection of a very detailed image of the distribution, i.e. a radio image of the sun. On the wave 10 a rather coarse image of the distribution is obtained because of the great width of the diagram. The radio isophotic lines of the sun on the wave lengths 3,2 and 10 cm are illustrated in several figures. In the case of passage of the sun single regions with increased radio brightness occur in the diagram which is observed as a dazzling flash in the recording. With the wave length 3,2 cm regions with increased radio brightness are observed which are distributed very irregularly over the disk. The position of

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S/035/61/000/001/005/019
A001/A001

3,1720 (1041,1126,1127)

Translation from: Referativnyy zhurnal, Astronomiya i Geodeziya, 1961, No. 1, p. 45, # 1A339

AUTHORS: Salomonovich, A.Ye., Koshchenko, V.N., Noskova, R.I.

TITLE: On Intensity of Sun's Radio Emission at the 8-mm Wavelength Band

PERIODICAL: "Solnechnyye dannyye", 1959/1960, No. 9, pp. 83-89

TEXT: The authors present the changes of brightness temperature at the 8-mm wavelength during the period from 1957 to 1958. Observations were carried out near Moscow with a 2-m parabolic reflector. The average brightness temperature of the Sun during this period was equal to 8,000°K, the temperature of the quiet Sun was 6,400 ± 800°K. The correlation coefficient between the brightness temperature and the summary area of sunspots amounts to 0.4. There are 5 references.

N. S.

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

Card 1/1

SALOMONOVICH, A. Ye.

Thermal Radio Radiation of the Moon and Certain Characteristics of Its Surface Layer.

report presented at the International Symposium on the moon, held at the Pulkovo Observatory, Leningrad, USSR, 6-8 Dec 1960.

85979
S/141/60/003/004/004/019
E032/E314

9.9840

AUTHORS: Salomonovich, A.Ye. and Atayev, O.M.

TITLE: Thermal Emission and Absorption of 8-mm Band Radio Waves in the Earth's Atmosphere

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol. 3, No. 4, pp. 606 - 613

TEXT: Molecular absorption of 8-mm radio waves has been measured by measuring the natural thermal emission by the Earth's atmosphere. The absorption coefficients were obtained using a spherically symmetrical model of a humid atmosphere, in which absorption and scattering of radio waves by the condensed phase are neglected. For clear days, which are quite well described by this model, the following values were obtained for the absorption coefficients in oxygen and water vapour, respectively:

$\varkappa_{01} = 0.0046$ neper km^{-1} = 0.04 db km^{-1} per 1 g.m^{-3}

$\varkappa_{02} = 0.00046$ neper km^{-1} = 0.004 db km^{-1}.

The natural emission of the atmosphere on λ = 8 mm was measured using a radio telescope with a parabolic reflector,

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2 m in diameter, and a modulation radiometer. The above value for the absorption coefficient in oxygen is in satisfactory agreement with the value calculated by Van Vleck (Ref. 11) and the experimental values obtained by Marner (Ref. 1) and Aarons et al (Ref. 5). The value obtained for water vapour is also in reasonable agreement with the theoretical calculations of Van Vleck and laboratory measurements by Becker and Autler (Ref. 12). There is, however, a residual discrepancy between the various results for water vapour. This is probably due to the fact that absorption by the condensed phase was not taken into account. The above model should be suitably amended.

Acknowledgments are expressed to N.A. Amenitskiy, S.K. Palamarchuk and N.D. Dolotenkova who took part in the present work and to V.S. Trotskiy for valuable discussions.

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Thermal Emission and Absorption of 8-mm Band Radio Waves in the Earth's Atmosphere

There are 7 figures and 12 references: 2 Soviet and 10 English.

ASSOCIATION: Fizicheskiy institut imeni P.N. Lebedeva AN SSSR (Physics Institute imeni P.N. Lebedev of the AS USSR)

SUBMITTED: January 3, 1960

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78028
SOV/33-37-1-28/31

3.1710

AUTHORS: Amenitskiy, N. A., Noskova, R. I., Salomonovich, A. Ye.

TITLE: The Radio Image of the Moon in an 8-mm Wave Range

PERIODICAL: Astronomicheskiy zhurnal, 1960, Vol 37, Nr 1, pp 185-186 (USSR)

ABSTRACT: Observations of the two-dimensional distribution of the thermal radiation of the moon in the 8-mm wave range were made during September-November 1959 with the 22-meter radiotelescope of the Lebedev Physical Institute of the Academy of Sciences, USSR. Owing to the great resolving power of this telescope, it was possible to obtain values of the radiation temperature for separate regions of the moon. There is considerable dependence of the distribution of radio brightness on the phase of the moon which appears to be asymmetrical. Thus, at the first quarter the western part of the moon is brighter, and the reverse is true at the third quarter. The difference between the maximum and the minimum temperatures in the center of the disk is more than 40%.

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The Radio Image of the Moon in an 8-mm Wave Range

The authors thank G. G. Basistov, N. F. Il'in, V. N. Koshchenko, and V. I. Pushkarev, who assisted in making observations. There are 1 figure; and 3 references, 2 Soviet, 1 U.S. The U.S. reference is: J. E. Gibson, Proc. I.R.E., 1, 280-286, 1958.

ASSOCIATION: Lebedev Physical Institute of the Academy of Sciences, USSR (Fizicheskiy institut imeni P. N. Lebedeva Akademii nauk SSSR)

SUBMITTED: December 11, 1959

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80830

S/033/60/037/02/008/013
E032/E914

3.1720

AUTHORS: Kuz'min, A. D., Salomonovich, A. Ye. [redacted]

TITLE: Radio Emission of Venus in the 8mm Region

PERIODICAL: Astronomicheskiy Zhurnal, 1960, Vol 37, Nr 2, pp 297-300 (USSR)

ABSTRACT: Radio emission of Venus in the centimeter and millimeter ranges is of great interest since it provides information on the atmosphere and surface of the planet, and also on its period of revolution. Measurements of the intensity of this emission by Mayer et al (Refs 1 and 3) and Alsop et al (Ref 2) in the 3 cm and 10 cm regions have led to a brightness temperature of the apparent disc of about 550°K, i.e. almost twice as high as the radiometric temperature measured by Pettit and Nicholson (Ref 10) in the infra-red region of the spectrum. It is thus of particular interest to carry out measurements in the millimeter range. Measurements reported by Gibson and McEwan (Ref 4) gave a value of 410° ± 160°. Since this value is not sufficiently accurate, the present authors carried out similar measure-

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Radio Emission of Venus in the 8mm Region

ments on 8 mm, using the radio-telescope of the Physical Institute imeni P. M. Lebedev of the Academy of Sciences (USSR). This telescope was described by Salomonovich in Ref 6 and has a parabolic mirror 22 m in diameter. The width of the radiation pattern of the radio telescope was 1.9' x 1.9' at 3 db. The detector was a modulated radiometer having a sensitivity of 2-3°K and a time constant of 5 sec. The brightness temperature of Venus averaged over the apparent disc is shown in Fig 2 as a function of time. The dotted line indicates the measurement reported by Gibson and McEwan in Ref 4. The temperature appears to increase as Venus departs from the inferior conjunction. This is an

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indication of the fact that there is a temperature difference between the illuminated and unilluminated parts of the disc. The phase dependence of the brightness temperature suggests that at least part of the radiation is due to the solid surface of the planet. One of the possible reasons for the observed difference between the temperatures on 8 mm and 3 cm may be that there is a strong dependence of the amplitude of the variable component, averaged over the disc, on wavelength (as in the case of the Moon). However, this is not very probable. Another possible reason is that there is a stronger absorption of shorter wavelengths in the relatively cold atmosphere of Venus. The present measurements indicate that the brightness temperature of Venus averaged over the visible disc is 315 ± 70°K. This value was obtained

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Radio Emission of Venus in the 8 mm Region

by averaging over 17 days after inferior conjunction. There are 2 figures, 10 references, of which 6 are English and 4 are Soviet.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva, Akademii nauk SSSR (Physical Institute im. P. N. Lebedev, Academy of Sciences USSR)

SUBMITTED: December 15, 1959.

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87245
S/033/60/037/006/003/022
E032/E514

6.9417
3.1720 (1041,1126,1127)

AUTHOR: Salomonovich, A. Ye.

TITLE: Localization of Bursts of Radio Emission on 8 mm Wavelength

PERIODICAL: Astronomicheskiy zhurnal, 1960, Vol.37, No.6, pp.969-974

TEXT: The 22 m radio telescope of the Physics Institute imeni P. N. Lebedev, which has a parabolic reflector (Ref.4), was used to detect and localize two bursts of radio emission on λ = 8 mm. The first burst was recorded on June 12, 1959 at 9 hours 17 min U.T. and was located inside a calcium plage and connected with the group of spots No.316 (Ref.5; φ = +17, λ = 330). It was observed right up to 11 hours 10 min. The second burst was observed on June 16, 1959 at 6 hours 54 min in the same region. Fig.1 shows the records obtained in the two cases. Fig.2 gives radio charts of the Sun for these two dates, showing a two-dimensional brightness distribution on λ = 8 mm in the region of the bursts. It is concluded that the extended active region in the neighbourhood of the No.316 group of spots was the source of bursts of radio emission in the relatively wide frequency range for a number of days (at least for June 9-16). It is natural to suppose that bursts

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Localization of Bursts of Radio Emission on 8 mm Wavelength

recorded during these days on other wavelengths in the centimetre and decimetre ranges (in particular on 536, 808, 300 and 19 000 Mc/s), which coincided with chromospheric flares localized in the neighbourhood of the No.316 group, were also due to the above active region, although they could not be localized owing to insufficient resolution of the radio telescopes employed. It is estimated that the flux densities of the above two bursts were p (9^h02^m) = 21×10^{-22} W/m^2 cps and p (6^h27^m) = 830×10^{-22} W/m^2 cps, respectively. The corresponding brightness temperatures are estimated to have been 5.41×10^4 °K and 9×10^5 °K. The former figure refers to 9 hours 02 min on June 12 and the latter to the maximum of the burst on June 16. There are 3 figures, 1 table and 8 references: 4 Soviet and 4 non-Soviet.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR)

SUBMITTED: April 30, 1960

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6.9417
3,1720

S/033/60/037/006/004/022
E032/E514

AUTHORS: Kuz'min, A. D., Levchenko, M.T., Noskova, R. I. and Salomonovich, A. Ye.

TITLE: Observations of Discrete Sources of Radio Emission on 9.6 cm Wavelength

PERIODICAL: Astronomicheskiy zhurnal, 1960, Vol.37, No.6, pp.975-978

TEXT: Preliminary results are reported of observations of discrete sources of radio emission on λ = 9.6 cm obtained with the 22 m radio telescope of the Physics Institute, AS, USSR. This telescope was described by Salomonovich (Ref.1). Altogether 50 sources were recorded of which 34 were observed for the first time in the centrimetre range. The results obtained are illustrated in the Table on pp.976-977, which gives coordinates and various characteristics, as well as identifications with optical objects and radio sources observed by Haddock et al. (Ref.3) and Westerhout (Ref.4) on 9.4 and 21 cm, respectively. The table includes a number of interesting objects, among them two planetary nebulae (NGC 7293 and NGC 6853) for which radio emission cannot be detected. For these objects an upper limit for the flux density of radio emission is estimated. These estimates are included in the table.
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80178

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3.1710
3(1) 3.1720

AUTHOR: Salomonovich, A.Ye.

TITLE: Lunar Radio Emission

PERIODICAL: Priroda, 1960, # 5, pp 11-18 (USSR)

ABSTRACT: This is a popular account information on the moon obtained from new radiological astronomical investigations. Two other papers on this subject were published in "Priroda": S.E. Khaykin, 1956, # 8, and V.V. Sharonov, 1960, # 1. After a general introduction on thermal electromagnetic radiation the author tells how radio emission from the moon is observed. After explaining the principle of a radiotelescope he states that by now it is possible to receive and separate radio waves from areas having dimensions 10 to 15 times less than the angle span of the moon. The major interest in this research is in radio waves in centimeter and millimeter bands. Thus radio emission capacity of the moon or its "brightness temperature" as well as its "radiotemperature" (the behavior of the brightness temperature along the moon's

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Lunar Radio Emission

radio wave range) can be studied with quite astonishing accuracy. The next section of the article deals with the radiotemperature of the moon in relationship to the moon's phases. Three laws, discovered up to this time in this field, are shortly explained, namely: (1) If the length of electromagnetic waves increases the oscillations of the radiotemperature of the moon, related to its phases, diminish; (2) The radiotemperature of the moon, measured on a 16 to 12 mm band, always appears with a certain delay in respect to the respective temperature change on the given part of the moon's surface; (3) No change in radiotemperature of the moon has ever been observed during the moon's eclipses. The following Soviet astronomers are mentioned in this section of the article as having worked in this field: N.L. Kadanovskiy, M.T. Turusbekov, S.E. Khaykin, M.R. Zelinskaya, V.S. Troitskiy, L.I. Fedoseyev, N.A. Amenitskiy, R.I. Noskova and the author himself. The next section of the article deals with "radiopic-

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tures of the moon" as obtained with the radiotelescope of the Fizicheskiy institut im. P.N. Lebedeva Akademii nauk SSSR (Institute of Physics imeni P.N. Lebedev at the AS USSR), pictured on p 15. The reflector of the parabolic antenna of this radiotelescope measures 22 m in diameter. The radiopicture of the moon was obtained by using 8-mm radio waves. Two schematic radiopictures of the moon are given on p 16. In order to clear up the laws governing the radioemission of the moon the author describes in the next section which thermal processes are assumed to be going on under the surface of the moon. The longer the radio waves emitted by the moon, the deeper under the surface the substance which emitted them is assumed to be. The scientists, working in this field (the merits of V.S. Troitskiy are especially stressed), have stated that the surface of the moon must be formed of a very porous or even dusty substance over 10 cm thick. This model of the surface of the moon, called a "one-layer" model, is favored by the author as well, as opposed to the "two-layer"

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theory. There is 1 photograph, 1 graph, 1 set of graphs and 4 schematic figures.

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S/107/61/000/007/001/002
D201/D304

3,1720 (1041, 1126, 1129)

AUTHORS: Kuz'min, A. and Salomonovich, A.

TITLE: Radioastronomical observations of Venus

PERIODICAL: Radio, no. 7, 1961, 6-7

TEXT: In the present article the authors discuss briefly radioastronomy as a means of investigating the physical properties of the surface of Venus. The use of radioastronomy for this purpose is possible because Venus, being a heated body, radiates electro-magnetic waves. The power of this radiation is determined by the body temperature and the radiation capacity, the latter depending on the body structure; according to Kirchhoff's law this radiation capacity is proportional to its absorption capacity. In radioastronomy the intensity of radiation of an ideally black body, which is characterized by the density of radiation flux P (defined as the total energy emitted by the source in the frequency band eg. 1 c/s and falling in 1 sec. onto a surface of $1m^2$) is determined

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by the body temperature T by the following expression $p=\frac{2\kappa T\Omega}{\lambda^2}$ (1) where k = 1.38 x 10^{-23} Joule/°C - the Baltzmann constant, λ - the wavelength being received, Ω - solid angle subtended by the body under observation. The power of the signal being received is given by $P_{rr}=\frac{pA}{2}=\frac{\kappa T\Omega A}{\lambda^2}$, where A is the effective antenna area. Having measured the power of the signal received from Venus, it is easy to determine its brightness temperature (defined as the temperature of an absolutely black body, radiating the same power, in the same frequency band and within the same solid angle as the source). The radiation capacity of a body is proportional to its absorption capacity and may be different for different wavelengths. Thus the earth's atmosphere is completely transparent for wavelengths from 7 - 10 m down to 2 cm., but becomes noticeably absorbing for shorter wavelengths. By applying the above principle to radiation emitted by Venus, both its atmospheric and surface temperatures can be

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determined. Since the angular dimensions of Venus are very small its radiation flux is very small, e.g. at a wavelength of 10 cm

$$p = 10^{-25} \frac{\text{watt}}{m^2/c/s}$$

and observations are therefore extremely difficult. After mentioning the first observations of Venus in 1956 by American scientists, the authors point out that fuller data were obtained by them personally using a 22 meter radiotelescope of the Fizicheskiy institut (Institute of Physics) of the Academy of Sciences, USSR. The observations were made at a wavelength of 8 mm. The resulting increase in signal strength permitted determination of Venus' temperature at various degrees of its illumination by the sun. It can be assumed that the illuminated surface of the planet has a temperature of several hundred degrees centigrade. It follows that future radio installations on Venus would have to be able to with-

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stand working temperatures of this order. The temperature of Venus as obtained using an 8 mm wavelength is about 1.5 times smaller than that obtained using lower frequencies which seems to indicate that shorter waves are partly absorbed in its colder atmosphere. It seems that the dark side of Venus has a temperature of about 0°C. Another deduction which can be made from the above observations is that because of absorption of 2 cm. waves in the atmosphere of Venus, this atmosphere should contain water vapor or carbon dioxide or both. It also proves that it is unlikely that the surface of Venus consists of nothing but oceans. An "all-water" surface would eliminate the large differences in temperature observed between its dark and illuminated parts. The above is based on the assumption that radiation from Venus is of thermal origin. There are serious indications that this is so, e.g. the fact that measurements using 3 and 10 cm. both gave the same brightness temperature. Nevertheless

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certain scientists [Abstractors note: Not mentioned.] do not exclude the possibility of the so-called non-thermal mechanism of radiation from the planets, in which case the observed temperature would not be the true planet temperature. There is 1 figure.

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SALOMONOVICH, A.Ye.

Observations of the moon's heat radiation in the radio-wave range and some characteristics of the moon's surface layer. Astron.tsir. no.218:4-6 F '61. (MIRA 14:7)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR.
(Moon)

KUZ'MIN, A.D.; SALOMONOVICH, A.Ye.

Radio emission of Venus on the 9.6 cm. wavelength. Astron.tsir. no.221:3-5 Ap '61. (MIRA 14:11)

1. Fizicheskiy institut imeni P.N. Lebedeva AN SSSR.
(Venus(Planet))
(Radio astronomy)

25942
S/141/61/004/001/002/022
E032/E314

3.1720 (1126, 1127, 1129, 1395)

AUTHORS: Kaydanovskiy, N.L. and Salomonovich, A.Ye.

TITLE: On the Determination of the Characteristics of the Lunar Surface Using Observations Obtained with High-resolution Radio Telescopes

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol. 4, No. 1, pp. 40 - 43

TEXT: According to the theory of thermal radio emission of the Moon, as developed by Troitskiy (Ref. 1), the brightness radio temperature of the Moon for a uniform spherical model is given by

$$T_e(\varphi, \psi, t) = T_{e_0} + \sum_{n=1}^{\infty} T_{e\sim n} \cos(n\omega t - n\varphi - \xi_n), \quad (1)$$

where

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$$T_{e_0}' = (1 - R)\left[T_H + \frac{a_0}{2} D\eta(\psi) \right];$$

$$T_{e-n}' = (1 - R)\frac{a_n D\eta(\psi)}{\sqrt{1 + 2\delta_n \cos\alpha + 2\delta_n^2 \cos^2\alpha}} \qquad (2)$$

In these expressions φ and ψ are the selenographic longitude and latitude, respectively, $R(\varphi, \psi)$ is the reflection coefficient, T_H is the night temperature of the surface, $D = T_\Pi - T_H$, where T_Π is the temperature of the surface at the point directly facing the Sun, $\eta(\psi)$ is the temperature distribution function for the Moon illuminated by the Sun,

$$a_n = \frac{1}{\pi} \int_{-\pi/2}^{+\pi/2} \eta(z)\cos(nz)dz ,$$

ω is the angular frequency

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of the Moon, $\zeta_n = \text{arc tg} \frac{\delta_n}{1 + \delta_n}$ is the phase shift of the n-th harmonic, $\delta_n = \beta_n/\varkappa$ is the ratio of the depth of penetration of an electromagnetic wave $1/\varkappa$ to the depth of penetration of the n-th harmonic of the temperature wave $1/\beta_n$, and α is the angle of incidence of a ray from within the lunar crust onto the surface. Since up to recently the radio emission of the Moon has been recorded with low-resolution radio telescopes, the quantity that was measured was not $T_e(\varphi, \psi, t)$ but, rather, a certain temperature representing the average over the lunar disc. The latter depends on the polar diagram of the radio telescope (Troitskiy - Ref. 1). In order to determine the physical characteristics of the lunar surface it is necessary to obtain T_H and T_Π from radiometric measurements.

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Moreover, it is also necessary to assume some specific form for the functions R and η. The form of these functions was chosen as in Ref. 1, using optical data wherever possible. Since radio telescopes measure the projection of the distribution $T_e(\varphi, \psi, t)$ onto a plane, it is expedient to transform the selenographic coordinates φ, ψ to the rectangular coordinates x, y on this plane. These axes are respectively parallel to the Equator and the Central Meridian of the lunar disc. The relation between x, y and φ, ψ is given by the usual formulae

$$x = r \sin \varphi \cos \psi ; \quad y = r \sin \psi \tag{3}$$

where r is the radius of the Moon. For points on the Equator

$$x = r \sin \varphi, \quad y = 0 \tag{4}$$

while for points on the Central Meridian

$$x = 0, \quad y = r \sin \psi \qquad (5).$$

To begin with, consider the constant component

$$T_{e,o}(x, y) = [1 - R(x, y)]\,[T_H + (a_o/2)D\tilde{\eta}(y)]$$

where

$$\tilde{\eta}(y) = \eta\left(\arc \sin \frac{y}{r}\right).$$

In the above plane, the radio isophotes $T_{e,o}$ = const. take the form of approximately oval curves with a common centre at the centre of the disc and the y-axis as the axis of symmetry. This follows from the assumption that the lunar surface is homogeneous. The variable component $T_{e\sim}$ is superimposed on the $T_{e,o}$ distribution and, in general, distorts the symmetry of the isophotes, displacing the point with the maximum brightness towards the point immediately below the Sun, i.e. it displaces the "centre of gravity" of the emission. When the higher harmonics of $T_{e\sim}$ can be neglected, and when it can be assumed that $\cos \alpha \approx 1$, an approximate distribution of the radio isophotes of the constant component can be obtained directly, using the $T_e(x, y)$ distribution obtained with maximum displacements of the "centre of gravity" of the emission, i.e. for $\omega t - \xi = \Phi = \pi/2$ or $\Phi = 3\pi/2$. The isophotes of the constant components $T_{e,o}$ can in turn be used to obtain the curve $\tilde{\eta}(y)$ and then to compute the dielectric constant. As will be shown below, the observations must be carried out with the linearly polarised exciter of the radio telescope arranged at an angle of $\pm\pi/4$ to the lunar equator (the x-axis). The distribution along the Equator in the case of the constant component is then given by

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$$T_e(x,\ 0,\ \Phi) = [1 - R(x,\ 0)] \left\{ T_{\text{н}} + \frac{a_0}{2} D + \right.$$

$$\left. + \frac{a_1\ D}{\sqrt{1 + 2\delta_1 + 2\delta_1^2}} \left(\cos\Phi \sqrt{1 - \frac{x^2}{r^2}} + \sin\Phi \frac{x}{r} \right) \right\}.$$

and hence when $\Phi = \pi/2$

$$\frac{T_e(x,\ 0,\ \pi/2) + T_e(-x,\ 0,\ \pi/2)}{2T_e(0,\ 0,\ \pi/2)} = \frac{1 - R(x,\ 0)}{1 - R(0,\ 0)}. \qquad (6)$$

On the other hand, when $\Phi = \pi/2$, the distribution along the Meridian is

$$T_e(0,\ y,\ \pi/2) = T_{e,o}(0,\ y,\ \pi/2).$$

Moreover, in accordance with Eq. (1), the distribution of the constant component along the Central Meridian is given by

$$\frac{T_{e_0}(0,\ y,\ \pi/2)}{T_{e_0}(0,\ 0,\ \pi/2)} = \frac{|1 - R(0,\ y)|}{|1 - R(0,\ 0)|}\ \frac{|T_{\text{н}} + (a_0/2) D\bar{\eta}(y)|}{|T_{\text{н}} + (a_0/2)\ D|}. \qquad (7)$$

Assuming that the emissive power as given by Eq. (6) is independent of local changes and that it is the same along Ox and Oy, it is possible to choose $\tilde{\eta}(y)$ (with T_H and D known from radiometric measurements) so that the righthand side of Eq. (7) should be equal, as near as possible, to the lefthand side which is obtained from measurements. Having determined the form of the function $\tilde{\eta}(y)$ and consequently knowing a_o, the value of 1 - R and of the dielectric constant $\eta(\varphi)$ can be calculated from Eq. (2).

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The measured amplitudes of the harmonics of the variable component of the brightness temperature can then be used to determine the depths of penetration of the electromagnetic and the n-th thermal waves and to calculate the effective electrical conductivity and the loss angle Δ .
There are 5 references: 4 Soviet and 1 non-Soviet.

ASSOCIATION: Fizicheskiy institut im. P.N. Lebedeva AN SSSR (Physics Institute im. P.N. Lebedev of the AS USSR)

SUBMITTED: September 3, 1960

S/141/61/004/003/003/020
E133/E435

AUTHORS: Koshchenko, V.N., Kuz'min, A.D., Salomonovich, A.Ye.

TITLE: Thermal radio emission from the moon in the 10 cm band

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol.4, No.3, pp.425-427

TEXT: Previous investigations in the 10 cm band have been described by H.L.Kaydanovskiy et al (Ref.1: Transactions of the Fifth Conference on the Problems of Cosmogony, Izd. AN SSSR, M., 1956, p.347) and K.Akabane (Ref.2: Proc. Japan. Akad., 31, 161 (1955)). According to the first, the mean lunar brightness temperature, averaged over the disc, is 130°K with a variation of 8% due to the phase changes. The corresponding values in the second are 315°K and 25% variation. A single measure of 215°K is referred to in the paper of J.H.Piddington and H.C.Minnett (Ref.3: Austr. J. Sci. Res., 4A, 459 (1951)). In order to clear up these discrepancies and to study the variation in thermal radio emission with phase, measurements have been made by the present authors at a wavelength of 9.6 cm. The 22 m telescope of the Lebedev Physical Institute was used; this and the receiver used have been described in earlier work. Antenna temperatures

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E133/E435

Thermal radio emission from ...

were obtained in the range 132 to 154°K, depending on the phase. Successive scans were made across the lunar disc, systematically displaced from one another. The maximum value thus derived for the antenna temperature corresponded to central passage across the disc. The temperature obtained was averaged over the whole disc. Amplification and scattering coefficients had been obtained earlier from observations of Taurus A (Ref.6: A.M.Karachun et al, Radiotekhnika i elektronika, 6, 430 (1961)). The present observations, made during April - May 1960, gave an average brightness temperature of 230 ± 3.5°K. The variation from this average did not exceed ± 1.5% at any lunar phase. This result agrees well with the data given in Ref.7 (P.G.Mezger, H.Strassl, Planet Space Sci., 1, 213 (1959)) for the 20 cm band (250°K ± 12%) and also with a single measure made by G.Westerhout (Ref.8: Bull. Astron. Inst. Netherlands, 14, 215 (1958)) of 232 ± 50°K. The absence of temperature change with phase in the decimeter band agrees with the thermal emission of the Moon predicted by V.S.Troitskiy (Ref.10: Astron. zh. 31, 511 (1954)). N.L.Kaydanovskiy, M.T.Turusbekov and S.E.Khaykin are mentioned in

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the paper. There are 1 figure and 10 references: 5 Soviet-bloc and 5 non-Soviet-bloc. The references to English language publications read as follows:
Ref.2: as quoted in text;
Ref.3: as quoted in text;
Ref.7: P.G.Mezger, H.Strassl, Planet Space Sci., v.1, 213 (1959).

ASSOCIATION: Fizicheskiy institut im. P.N.Lebedeva AN SSSR
(Physics Institute imeni P.N.Lebedev AS USSR)

SUBMITTED: November 10, 1960

S/141/61/004/003/019/020

3,1720 (1126, 1127, 1129)

AUTHORS: Kislyakov, A.G., Kuz'min, A.D., Salomonovich, A.Ye.

TITLE: Radio emission from Venus in the 4 mm band

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol.4, No.3, pp.571-572

TEXT: Observations of Venus were made in March 1961, using the 22 m radio telescope of the Fizicheskiy institut imeni P.N.Lebedev AN SSSR (Physics Institute imeni P.N.Lebedev AS USSR) in the 4 mm band. The method which was employed has been described previously (Ref.2: A.D.Kuz'min, A.Ye.Salomonovich, Astron. zh., v.37, 297 (1960)). Guiding on the planet was by optical observation with slow trailing in azimuth. The antenna temperature was determined by two methods. The first was by inserting an absorbing wedge, at air temperature, in the signal path. The error in the resulting value for the temperature was within ± 7%. The second method was by comparison of the signal with the atmospheric radiation. (The atmospheric absorption values for 4 mm waves are well known.) This second method was used as a check on the first. The major error in reducing the

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[illegible]
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Radio emission from Venus ... E133/E435

observations probably lies in the calculation of the average temperature over the whole of the planetary disc. In this connection, the halfwidth of the main beam was investigated and found to be 1°.6. The amount of [illegible] at the antenna was investigated by observing the Sun and Moon. The brightness temperature of Venus, averaged over the whole disc, was then found to be 390°K ± 120°K. There are 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc. The reference to an English language publication reads as follows:
Ref.3: A.W.Straiton, C.W.Tolbert. Proc. IRE, v.48, 898 (1960).

ASSOCIATIONS: Fizicheskiy institut im. P.N.Lebedeva AN SSSR (Physics Institute imeni P.N.Lebedev AS USSR)
Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Institute for Radiophysics at Gor'kiy University)

SUBMITTED: May 9, 1961

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30674
S/141/61/004/004/001/024
E032/E514

3.2500 (1080)
3.1700

AUTHORS: Salomonovich, A.Ye. and Koshchenko, V.N.

TITLE: Observations of lunar thermal radio emission at 2 cm wavelength

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol.4, No.4, pp.591-595

TEXT: This paper was first read at a meeting of the Planet Commission of the Astrosoviet (Astronomical Council) in October, 1960. The authors report observations of the lunar radio emission at 2 cm wavelength which were carried out in November-December, 1959 using the 22 m radio telescope of the Physics Institute of the Academy of Sciences. This telescope was described by the first of the present authors (Ref.2: Radiotekhnika i elektronika, 4, 2092, 1959). The radiation was detected with a ferrite radiometer of the "usual type". The high frequency part of the detector was placed together with the i.f. amplifier near the focus of the 22 m paraboloid. The open end of a circular wave-guide was used as the feeder. The electric vector of the linearly polarized wave incident on the system was

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Observations of lunar ... S/141/61/004/004/001/024
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at an angle of 45° to the plane of the horizon. The beam width at 3 db in the E and H planes was just greater than 4'. The antenna temperature was measured as described by the first of the present authors (Ref.3: Astron.zhurn., 35, 129, 1958). The systematic error in the determination of the brightness temperatures was about ±15%. Fig.1 shows typical distributions obtained for six different optical lunar phases. It is found that there is a systematic displacement over the lunar disc of the maximum brightness temperature and this follows the sub-solar point. An attempt was made to estimate the functional form of the variation in the surface temperature, using the method described by N. L. Kaydanovskiy and A. Ye. Salomonovich (Ref.5: Izv. vyssh. uch. zav. Radiofizika, 4, 40, 1961). The variation appears to follow a $\cos^{1/2}\psi$ law, where ψ is the selenographic latitude. Assuming that the surface temperatures at the centre of the disc at lunar noon and midnight are 407 and 125°K, respectively, it is found that the ratio of the depth of penetration of radio and thermal waves is $\delta = 4.4 = 2.2\lambda$. The result $\delta/\lambda = 2.2$ differs somewhat from that obtained at 1.63 cm wavelength by M.R.Zelinskaya, V. S. Troitskiy, and L. I. Fedoseyev (Ref.6: Astron.zh.31,643,1959).

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Observations of lunar ... S/141/61/004/004/001/024
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Using the value $\delta = 4.4$ it can be shown (V. S. Troitskiy, Ref.1: Astron. zh. 31, 511, 1954) that the phase delay of the variable component of the temperature relative to the optical phase is about 39°, which is in agreement with observations. Fig.3 shows the brightness temperature at the centre of the lunar disc T_{μ}, °K as a function of the phase Ψ, deg. It is clear that the phase variation may be approximated by the expression $T_{\mu}(\Phi_{opt}) = 190 - 20\cos(\Phi_{opt} - 40°)$. Acknowledgments are expressed to N. A. Amenitskiy who developed the radiometer and took part in the measurements and to R. I. Noskova who assisted in the analysis of the records. There are 3 figures and 6 references: 5 Soviet and 1 non-Soviet. The English-language reference reads as follows: Ref.4: R. N. Bracewell, Austr.J.Phys., 9, 1-4, 1956).

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute imeni P. N. Lebedev AS USSR)

SUBMITTED: November 10, 1960

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30675
S/141/61/004/004/002/024
E032/E514

3,2500 (1040)

AUTHORS: Koshchenko, V.N., Losovskiy, B.Ya. and Salomonovich, A.Ye.

TITLE: The lunar radio emission at 3.2 cm wavelength

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol.4, No.4, pp.596-599

TEXT: The authors have measured the brightness temperature of the thermal radio emission of the moon at 3.2 cm wavelength using the 22 m radio telescope of the Physics Institute of the Academy of Sciences. Systematic changes in the two-dimensional radio brightness distribution were established. The beam width at 3 db was 6'.3 ± 0'.2 (Ref.3: V. M. Karachun, A. D. Kuz'min, A. Ye. Salomonovich, Astron. zhurn. (in press)). The sensitivity threshold of the detector was 3-4° at a time constant of 1 sec. Fig.1 shows some typical distributions obtained for different optical phases. These distributions were then used to determine the brightness temperature of the centre of the lunar disc $T_{\text{ʟ}}$ as a function of the lunar phase. The result is shown in Fig.2 (⊡ - August, ● - September, X - October, Δ - November, 1960). The average value of the brightness temperature was found to be

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30675

The lunar radio emission at ... S/141/61/004/004/002/024
E032/E514

223°K and the experimental points can be represented by the formula: $T_{\text{ц}} = 223 - 17 \cos (\Phi - 45)$ deg. Assuming that the latitude variation of the surface temperature (A. Ye. Salomonovich and V. N. Koshchenko, pp.591-595 this issue) is of the form $\cos^{1/2} \psi$ the theory given by V. S. Troitskiy (Ref.7: Astron. zhurn., 31, 511, 1954) may be used to estimate the ratio of the depth of penetration of radio and thermal waves δ into the lunar soil. The 3.2 cm observations yielded δ = 6.1 so that δ/λ = 1.9. This is approximately the same as the value obtained for λ = 2 cm (Ref.6: this issue pp.591-595). The measured value of the phase delay (45° ± 5°) is in good agreement with the calculated value (41°) obtained on the assumption of a uniform radiating layer. There are 2 figures and 7 references: 6 Soviet and 1 non-Soviet. The English-language reference reads as follows: Ref.5: R. N. Bracewell, Austr. J. Phys., 9, 1-4, 1956).

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute imeni P. N. Lebedev AS USSR)

SUBMITTED: January 23, 1961

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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446910010-5"

21658
S/109/61/006/003/013/018
E032/E314

3,1710 (1041, 1126, 1127)

AUTHORS: Kalachev, P.D. and Salomonovich, A.Ye.

TITLE: The Radiotelescope of the Physics Institute of the AS USSR, Incorporating a 22-m Parabolic Reflector

PERIODICAL: Radiotekhnika i elektronika, 1961, Vol. 6, No. 3, pp. 422 - 429

TEXT: The radiotelescope is in the form of a parabolic reflector having an aperture of 22 m and a focal length of 9.525 m (angular aperture 2Ψ = 120 deg). The design of the radiotelescope was carried out at the Physics Institute of the AS USSR and it was brought into use in the summer of 1959. Various radio-astronomical observations have already been carried out, including the 0.8 cm radio emission of Venus. The reflector can be rotated between -5 and +95 deg relative to the horizon. Azimuthal rotations of ± 80 deg are also possible. The radiotelescope incorporates a 110 mm refractor, used as an optical telescope-guide. The following facilities are available: a) automatic tracking of a given point on the

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The Radiotelescope ....

celestial sphere to within ± 30 deg; b) semi-automatic tracking in accordance with the programme fed in by the operator over given time intervals; c) alignment in a given direction from the control cabin; d) alignment in a given direction and motion with a given velocity controlled by the operator in the visual-alignment cabin. Angles can be measured to within 7.5". Photographs of the telescope are reproduced and a brief description is given of some it its mechanical parts. Further details are given in the next abstract. There are 6 figures and 1 Soviet reference.

ASSOCIATION: Fizicheskiy institut im. P.N. Lebedeva AN SSSR (Physics Institute im. P.N. Lebedev of the AS USSR)

SUBMITTED: May 10, 1960

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446910010-5"

21659

3,1710 (1041, 1126, 1127)
9,1800

S/109/61/006/003/014/018
E032/E514

AUTHORS: Karachun, A.M., Kuz'min, A.D. and Salomonovich, A.Ye.

TITLE: A Study of Some of the Electrical Antenna Parameters of the 22 m Radio Telescope of the Physics Institute AS USSR

PERIODICAL: Radiotekhnika i elektronika, 1961, Vol.6, No.3, pp.430-436

TEXT: The present authors report the results of preliminary studies of the polar diagram, directivity and a number of other parameters of the parabolic antenna of the 22 m radiotelescope of the Physics Institute of the AS USSR imeni P. N. Lebedev. The experiments were carried out on 9.6 and 0.8 cm. Fig.1 shows a typical polar diagram obtained from a record of transits across the Cassiopea A source. The average of 27 measurements of the width of this pattern at 3 db was found to be 19'.0 ± 0'.15. The theoretical width at 3 db under optimum conditions should be 18'.3 and 19'.6 in the H and E planes. The side lobes do not exceed 20 db. The above figure is corrected for the finite angular dimensions of the source, as described by P. G. Mezger (Ref.5)

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A Study of Some of the Electrical ... S/109/61/006/003/014/018
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The Taurus A source was used to determine the effective area of the antenna, and assuming that $p = 7.9 \times 10^{-24}$ W m^{-2} cps^{-1} and the measured antenna temperature $T_a = 52.3° \pm 0.5°$, the effective area was found to be $A = 190$ $m^2 \pm 15\%$. The antenna surface utilisation factor was found to be 0.59. Fig.2 shows a typical polar diagram in the H plane; the width at 3 db with the feeder in the optimum position was found to be 1'.7 ± 0'.1. The width in the E plane at 3 db was found to be 2'.1 ± 0'.1. The expected widths were 1'.6 and 1'.7, respectively. The first side lobe was found to be at 12.2 db. The effective area on 0.8 cm was 150 $m^2 \pm 20\%$ and the antenna surface utilisation coefficient was 0.45. It is concluded that the accuracy with which the surface of the reflector has been manufactured ensured a polar diagram approaching the theoretical form. The following persons took part in the measurements N. A. Amenitskiy, G. G. Basistov, V. N. Koshchenko, M. T. Levchenko, N. F. Il'in, S. K. Palamarchuk and V. I. Pushkarev. D. V. Kovalevskiy and K. I. Stepnov are thanked for arranging for this work. There are 3 figures and 12 references: 7 Soviet and 5 non-Soviet.
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A Study of Some of the Electrical... S/109/61/006/003/014/018
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ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute imeni P. N. Lebedev AS USSR)

SUBMITTED: May 19, 1960

Fig.1

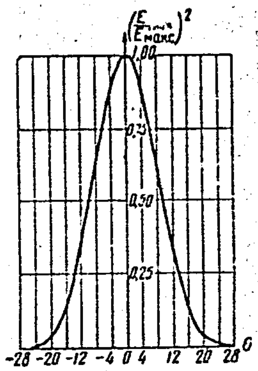
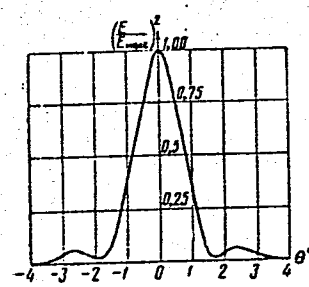


Fig.2



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S/033/61/038/001/006/019
E032/E314

3,1730 (1126,1129,1127)

AUTHORS: Karachun, A.M., Kuz'min, A.D. and Salomonovich, A.Ye.

TITLE: Observations of Some Discrete Radio Sources on 3.2 cm

PERIODICAL: Astronomicheskiy zhurnal, 1961, Vol. 38, No. 1, pp. 83 - 86

TEXT: The 22 metre radio telescope of the Physics Institute imeni P.N. Lebedev of the AS USSR (Salomonovich - Ref. 8) was used in June, 1960, to investigate a number of discrete radio sources on 3.2 cm. The sensitivity of the radiometer at a time constant of 4 sec was 1.5 °K. The parameters of the aerial were determined from measurements on Tau A. Fig. 2 gives the radio emission spectra of the following sources: Orion; Omega; Cyg A; Cas A based on the published results and the results obtained by the present authors. The present results are indicated by the double circles. The following table gives results of measurements and calculations of the flux p and angular dimensions θ of the observed sources:

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Observations of Some Discrete Radio Sources on 3.2 cm

Source	α_{1950}	δ_{1950}	T_A °K	$p.10^{24}$, W/m^2 cps	Θ
				[6]	[3!4]
Tau A	05h31m.5	22°00'	40	3.6±0.8	5'.1±0'.5
Orion	05h32m.8	-5°25'	24.5	5±0.8	5'.8±0'.5
Omega	18h17m.65	-16°15'	33.5	1.7±0.4	-
Cyg A	19h57m.75	40°35'	11.5	5±1	4'
Cas A	23h21m.2	58°32'	34		

The figures in square brackets are assumed. A consideration of the above spectra of Orion and Omega confirms the thermal mechanism of their origin. The spectrum of Cyg A cannot be described by a power law of the form $p = Af^n$ with n = const. The numbers on the graphs, Fig. 2, refer to the reference list at the end of this paper. The angular dimensions for Cas A are in

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Observations of Some Discrete Radio Sources on 3.2 cm

good agreement with the data of Jennison (Ref. 25) and Minkovski (Ref. 27). Acknowledgments are expressed to N.A. Amenitskiy, N.F. Il'in and V.N. Koshchenko for their assistance.

There are 2 figures, 1 table and 27 references: 7 Soviet and 20 non-Soviet.

ASSOCIATION: Fizicheskiy i-t im. P.N. Lebedeva Akademii nauk SSSR (Physics Institute im. P.N. Lebedev of the Academy of Sciences of the USSR)

SUBMITTED: August 25, 1960

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S/033/61/038/001/006/019
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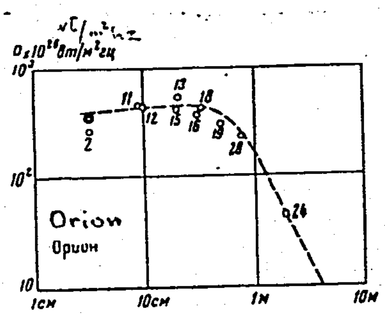
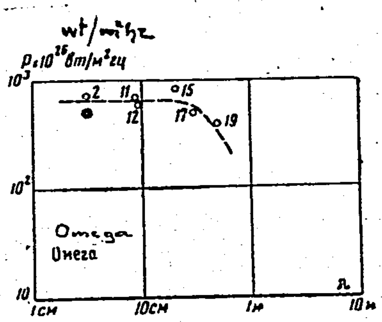
Observations of Some Discrete Radio Sources on 3.2 cm

Fig. 2a:



a

Fig. 2b:



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Observations of Some Discrete Radio Sources on 3.2 cm

Fig. 2c:

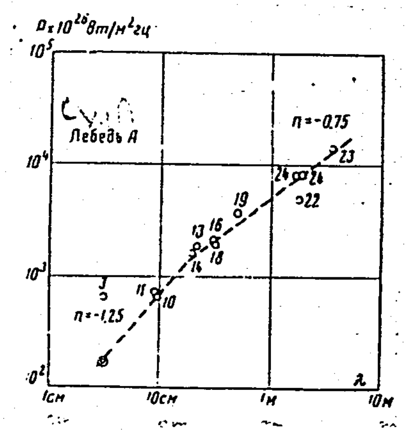
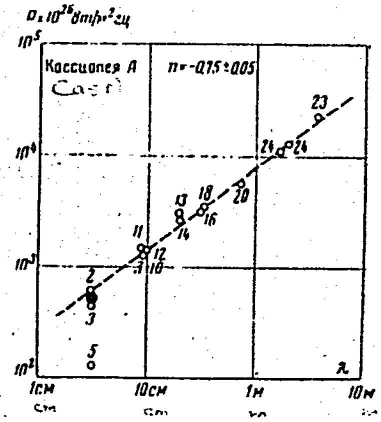


Fig. 2d:



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