KUZ'MIN, A.A.; AKHMAMEDOV, A.

Waters of the red series of the Kemir-Chikishlyar region. Trudy Turk. fil. VNII Part C no.6:38-42 '63 (MIRA 17:7)

KUZ'MIN, A.A.; GLAZOV, B.M.

Automatic program control of oil trap machinery. Mash. i neft. obor. no.12:20-23 '64. (MIRA 18:1)

1. Moskovskiy institut "Soyuzvodkanalproyekt".

USSR/ Electronics - Television receivers

Card 1/1 : Pub. 89 - 20/28

Authors : Kuz'min, A. D.

Title : A television receiver built with the 31LK1B cathode-electron tube

Periodical : Radio 1, 43-47, Jan 1954

Abstract : A 24-tube television receiver built with the 31LK1B cathode ray tube is described. One of its main features is an automatic video stabilizer. Detailed circuit diagrams are presented with a description of the principle components. Methods for winding the chokes and transformers are described. A. Kuz'minskiy, the constructor, was awarded a diploma of the first degree for the receiver at the 11th All Union Exhibition of radio amateurs'. Drawings; diagrams.

Institution: .....

Submitted: .....

KUZ'MIN, Arkadiy Dmitriyevich; SHAMSHUR, V.I., redaktor; SKVORTSOV, I.M. tekhnicheskiy redaktor.

[Measuring the noise coefficient of receiver and amplifier] Izmerenie koeffitsienta shuma priemno-usilitel'nykh ustroistv. Moskva, Gos.energ.izd-vo, 1955. 63 p. (MLRA 9:1)
(Radio--Interference)

AP6017483

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791.053.004.5:020.179.16

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Card 2/3

Diagram of the scanning of relatively thin welds.

Card 3/3

KUZ'MIN, A.D.

I-12

Category : USSR/Radiophysics - Application of radiophysical methods

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1975

Author : Kuz'min, A.D.
Title : Problems in the Measurement of the Intensity of Radio Waves from Cosmic Sources

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955, M., AN SSSR, 1956, 106-112, diskuss, 112

Abstract : A noise generator employing a 2D2S diode, the noise current of which is due only to shot effect, was used in the meter-wave band to measure the equivalent temperature of a radio source, referred to the antenna. The diode was loaded by a resistance equal to the output impedance of the antenna it replaced. The intrinsic capacitance of the diode was neutralized by a parallel inductance. The problem of measuring the equivalent temperature of the source was reduced to determining the diode d-c current at which the noise generator, connected to the receiver input, produces the same signal as the measured source. The inertia of the electrons can be neglected for waves longer than 20 cm if the 2D2S diode is used. A start was made, using the described procedure, to measure the intensity of the radio waves from the sun and from a source at Cassiopeia at 1 and 1.5 meters.

Card : 1/1

KAZMIN, A.D.

PHASE I BOOK EXPLOITATION 494

Smirnov, V. S.; Anisiforov, V. P.; Vasil'chikov, M. V.; Granovskiy, S. P.; Kazanskaya, I. I.; Kuz'min, A. D.; Mekhov, N. V.; Pobedin, I. S.

Poperechnaya prokatka v mashinostroyenii (Cross Rolling in the Machine-building Industry) Moscow, Mashgiz, 1957. 375 p. 4,500 copies printed.

Ed.: (title page): Tselikov, A. I., Corresponding Member of the USSR Academy of Sciences, and Smirnov, V. S., Doctor of Technical Sciences, Professor; Ed. (inside book): Kamnev, P. V.; Ed. of Publishing House: Leykina, T. L.; Tech. Ed.: Sokolova, L. V.; Managing Ed. of the Leningrad Branch of Mashgiz: Bol'shakov, S. A., Engineer.

PURPOSE: This book is intended for process engineers and machine designers engaged in the field of metalworking.

COVERAGE: The book contains a systematic discussion of the theory of cross rolling and helical cross rolling, and presents generalized conclusions from theoretical and experimental research work carried out, and experience gained in machine-building and metallurgical plants in the USSR. The cross-rolling processes, which are considered by the author as having wide potentialities, are currently used in several Soviet plants for the manufacture of bearing rolls and rollers,

Card 1/9

Some machine-building plants, e.g., the Gor'kovskiy avtomobil'nyy zavod (Gor'kiy Automobile Plant), have developed mills of their own design for cross rolling. The book is divided into four parts. Part I was written by V. S. Smirnov. Part II was written by S. P. Granovskiy, I. S. Pobedin, N. V. Mekhov and V. S. Smirnov. Part III was written by V. P. Anisiforov and I. I. Kazanskaya, and Part IV by A. D. Kuz'min and M. V. Vasil'chikov. There are 65 references, all of which are Soviet.

TABLE OF CONTENTS:

KUZ'MIN, A.D

AUTHOR: KUZJMIN, A.D. PA - 2012

TITLE: Some Radiation Characteristics of Cosmic Objects. (Nokotorye harakteristiki radioizlučenija kosmičeskih ob'ektov, Russian)

PERIODICAL: Radiotekhnika, 1957, Vol 12, Nr 1, pp 12-21 (U.S.S.R.)
Received: 2 / 1957 Reviewed: 3 / 1957

ABSTRACT: As cosmic radiation sources are utilized for a number of radio-technical measurements, the present paper deals with the characteristics of these radiations. One of the most fundamental among these characteristics is intensity. For the quantitative characterization of the intensity of radiation, radiation flux, brightness, and temperature are, as usual, used. After an explanation of the latter the determination of intensity at the input of the radio-receiving apparatus, which depends on cosmic radiation, is dealt with. The equation for the full power emitted by the antenna is set up, and for the purpose of comparing the intensity of the cosmic radiation at the input of the receiving apparatus with the power of its own noise, the temperature of the source, which is known in radioastronomy as antenna temperature and which irradiates the antenna, is used. Formulae are set up which make it possible to compute the equivalent temperature of the source for the case in which the diagram for the directivity of the antenna and the distribution of the characteristic temperature of the radiating object are known. For further analysis the notion of the effective solid angle of the antenna-directivity diagram is introduced. Two special cases of practical importance are investigated: 1. The case of a

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radiation reception from areas the characteristic temperature of which within the range of the antenna-directivity diagram changes only little, and 2. the case in which angles are small in comparison to the width of the diagram. The last chapter deals with the characteristics of the radiation intensity of cosmic objects, namely, the radiation of the sun, in which case it is necessary to distinguish between the sun "at rest" and the "fluctuating" sun, of the galaxy, and of the discrete sources. The coordinates and the intensity of the radiation of eight of the most intense discrete sources on USSR territory are shown in form of a table. As to planets, it is only said that radiation flux is very small because of the smallness of the angles of vision.

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress

CARD 2 / 2

Kuz'min, A.D.

AUTHOR: Kuz'min, A.D. 120-5-16/35

TITLE: Modulation in a Radio-interferometer Receiver (O modulyatsii pri interferentsionnom radiopriyeme)

PERIODICAL: Pribory i Tekhnika Eksprimenta, 1957, no.5, pp. 67 - 68 (USSR)

ABSTRACT: In a common arrangement of an interferometer receiver, there are two aerials. Each has mounted close to it a modulator and a head amplifier. The outputs from the latter are combined in a common receiver and synchronously detected at the modulation frequency. It is shown that if one modulator is omitted the system still has the same sensitivity and resolving power. It is then stated that if only one modulator is used in an N-aerial system, the output voltage is N/2 times that from a system with N moduldtors. This is a convenient arrangement in systems whose performance is limited by resolving power and not by sensitivity. There are 2 figures.

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

SUBMITTED: April 16, 1957.

AVAILABLE: Library of Congress.

Card 1/1

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000928020(

109-7-16/17

The Reception Diagram Control of a Radiointerferometer by Frequency Shifts of a Local Oscillator

the transformer being of unequal lengths.

ASSOCIATION "P.N.Lebedev" Institute for Physics of the Academy of Science of the U.S.S.R.

PRESENTED BY

SUBMITTED 4.1.1957

AVAILABLE Library of Congress

Card 2/2

KUZ'MIN, A.D.

Some radiation characteristics of celestial bodies. Radiotekhnika 12 no.1:12-21 Ja '57. (MLRA 10:3)
(Radio astronomy)

KUZ'MIN, A.D.; UDAL'TSOV, V.A.

Polarization of the radiation of the Crab Nebula on a 10 cm wave length. Astron. tsir. no.187:14-16 D '57. (MIRA 11:6)

1. Fizicheskiy institut im. P.N. Lebedeva AN SSSR.
(Nebulae) (Radio astronomy)

KUZMIN, A. D.,

WITH VITKEVICH, V. V., UDALTSOV, V. A. and SOLOMONOVICH, A. E., " Radioimage of the Sun on the 3 cm Wavelength,"

withUDALTSOV, V. A., "Polarization of the 10 cm radioemission of the Crab Nebula,"

papers submitted for the Symposium on Radio Astronomy, 30 July 58 - 6 Aug 58, Paris, France.

PARIYSKIY, N.N., kand. fiz.-mat. nauk, otv. red.; KONONOVICH, E.V., red.; KUZ'MIN, A.D., kand. tekhn. nauk, red.; MOGILEVSKIY, E.I., kand. fiz.-mat. nauk, red.; MUSTEL', E.R., red.; YEGOROVA, N.B., red. izd-va, KASHINA, P.S., tekhn. red.

[Total solar eclipses of February 25, 1952 and June 30, 1954; proceedings of the expedition] Polnye solnechnye zatmeniia, 25 fevralia g. i 30 iiunia 1954 g.; trudy ekspeditsii. Moskva, 1958. 357 p. (MIRA 11:12)

1. Akademiya nauk SSSR. Ekspeditsiya po nablyudeniyu polnykh solnechnykh zatmeniy, 1952 i 1954. 2. Chlen-korrespondent AN SSSR(for Mustel').

(Eclipses, Solar)

SOV-109-3-4-17/28

AUTHOR: Kuz'min, A. D.

TITLE: The Problem of Measurement of the Intensity of Radiation of the Sources having Small Angular Dimensions (K voprosu ob izmerenii intensivnosti radioizlucheniya istochnikov s malymi uglovymi razmerami)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 4, pp 561-562 (USSR)

ABSTRACT: The equivalent temperature of a radiating source at the receiving antenna is given by Eq.(1), where $T(\varphi, \theta)$ is the brightness temperature of the source, G is the gain of the antenna and $F(\varphi, \theta)$ is the directivity of the antenna. Normally, Eq.(1) is simplified to Eq.(2), where T_e is the effective temperature of the source, Ω_e is the spherical angle of the source, and Ω_a is the angular width of the antenna. It is shown that if the radiation pattern of the antenna is expressed by Eq.(4), and if it fulfils the conditions given by Eq.(5), the temperature T_a can be expressed by Eq.(6), where $\varphi_{0.5}$ and $\theta_{0.5}$ is the width of the radiation pattern. The accurate expression given by Eq.(6) is compared with Eq.(2) and the resulting

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SOV-109-3-4-17/28

The Problem of Measurement of the Intensity of Radiation of the Sources having Small Angular Dimensions

errors $\Delta\%$ are shown in the table on p 562. If Δ is to be less than 2%, the applicability of Eq.(2) is restricted to the range defined by Eq.(7). There is 1 table.

ASSOCIATION: Fizicheskiy institut im. P.N.Lebedeva AN SSSR (Physics Institute im. P. N. Lebedev, Soviet Academy of Sciences USSR)

SUBMITTED: October 30, 1956
Finally on May 22, 1957

1. Temperature--Determination 2. Radiation--Measurement 3. Antennas --Performance 4. Antenna radiation patterns--Measurement 5. Mathematics --Applications

Card 2/2

AUTHOR: Kuz'min, A.D. 109-3-5-15/17

TITLE: Combination of Several Radiators of Different Wavelengths in the Focus of a Parabolic Reflector (Sovmeshcheniye neskol'kikh obluchateley raznykh dlin voln v fokuse parabolicheskogo reflektora)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol III, Nr 5, pp 722 - 723 (USSR)

ABSTRACT: It is pointed out that a parabolic antenna can be simultaneously employed at several wavelengths if it is fitted with a number of radiating dipoles (see Fig.1). Such a system was constructed in 1955 in the Krymskaya radioastronomicheskaya stantsiya Fizicheskogo instituta AN SSSR (Crimean Radio-astronomical Station of the Physics Institute of the Ac.Sc.USSR). The parabolic reflector had a diameter of 4 m and was fitted with two receiving systems operating at wavelengths of 10 and 20 cm (see Fig.2). The radiator for the 10 cm band was in the form of a dipole which was excited by means of a waveguide placed in the focus of the paraboloid. The radiator of the 20 cm waveband consisted of two half-way dipoles with reflectors; these were situated in the focal plane at a distance of 5 cm from the focus; the dipoles were fed in phase. The directional patterns of the antenna for the two wavelengths

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109-3-5-15/17

Combination of Several Radiators of Different Wavelengths in the Focus of a Parabolic Reflector

are shown in Fig.3. It is thought that apart from radio-astronomy, this type of antenna can also find applications in radio-relay communication links.
There are 3 figures and 1 Soviet reference

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

SUBMITTED: May 30, 1957

AVAILABLE: Library of Congress

Card 2/2

1. Parabolic antennas-Operation 2. Dipoles-Applications

AUTHORS: Kuz'min, A.D., Khvoshchev, A.N. SOV/ 108-13-7-4/14

TITLE: A Wide-Range-Noise (-Voltage) Generator for the Decimeter Range (Shirokodiapazonnyy shumovoy generator detsimetrovogo diapazona)

PERIODICAL: Radiotekhnika, 1958, Vol. 13, Nr 7, pp. 36-42 (USSR)

ABSTRACT: A noise generator is described which serves the purpose of measuring the noise factor in radio receiving sets of the decimeter range. Without the necessity of re-tuning it covers the frequency range of 300-3000 kilocycles. Within this range the noise-temperature of the generator is constant and equals 15 900° K ± 7%. The voltage standing wave ratio is lower than 1,5, dying down is less than 35 db. Low noise temperatures can be obtained by switching on a calibrated attenuator in series connection with the noise generator. - The construction of the device and its experimental investigation are described. As a technical device this generator is not complete and its production is complicated. The most important part of the experiments was carried out in the NII MRTP by A.A.Sidorova and V.S.Savel'yev with the collaboration of M.T.Levchenko, L.A.Levchenko and V.S.Borodachëv. There are 7 figures, and 6 references, 2 of which are Soviet.

Card 1/2

20-118-6-11/43

AUTHORS: Vitkevich, V. V., Kuz'min, A. D.,
Salomonovich, A. Ye., Udal'tsov, V. A.

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

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A Radio Image of the Sun on 3,2 cm Wave Length 20-118 -6-11/43

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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these regions is very similar to the position of the groups of the optic spots observed on the same days. The radio isophotes on the wave length 10 indicate the existence of active regions the position of which is also similar to the position of the optic spots and of the active regions with the wave length 3,2 cm. At present the measuring results obtained are exploited and compared to the optical data. There are 1 figure and 1 reference, which is Soviet

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

PRESENTED: September 25, 1957, by D. V. Skobel'tsyn, Member of the Academy, USSR

SUBMITTED: September 19, 1957

Card 3/3

3(1),24(4)

AUTHORS: Kuz'min, A.D., and V.A.Udal'tsov SOV/33-36-1-5/31

TITLE: An Investigation of the Polarization of 10-cm Radiation of the Crab Nebula

PERIODICAL: Astronomicheskiy zhurnal, 1959, Vol 36, Nr 1, pp 33-40 (USSR)

ABSTRACT: On November 28, 1957 the extended full assembly of the committee for radio-astronomy heard a report about the contents of the present paper.
The polarization of the radio emission of the Crab nebula at a wave length of 9.6 cm was measured at the Crimean Radio-Astronomical Station of the FIAN from October to November 1957 with a 31 m radio telescope by means of a polarizing radiometer. The preparation of the apparata was carried out by the engineers M.T.Levchenko, L.I.Matveyenko, and the technicians M.V.Komarov, and V.V.Loktionov. The sensitivity of the radiometer amounted to 0.6 - 0.9° K for a bandwidth of 10 Mc/s and a time constant of 20 sec. The antenna temperature of one component of non-polarized emission was $T_a = 100^{\circ}$. The authors observed a linear polarization of radio emission of the Crab nebula with a degree of $3 \pm 0.5\%$. The position angle $\varphi = 142^{\circ} \pm 5^{\circ}$, and coincides with the

Card 1/2

An Investigation of the Polarization of 10-cm Radiation of the Crab Nebula SOV/33-36-1-5/31

direction of the greatest extension of the Crab nebula. The authors estimated the depolarization effects of the interstellar medium and the medium of the Crab nebula. They thank V.V. Vitkevich for giving the theme.
There are 8 figures, and 10 references, 7 of which are Soviet, and 3 Dutch.

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

SUBMITTED: January 10, 1958

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000928020(

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

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 $550^{\circ}K$, i.e. almost twice as high as the radiometric temperature measured by Pettit and Nicholson (Ref 10) in the infrared 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 $410^{\circ} \pm 160^{\circ}$. 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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Radio Emission of Venus in the 8 mm Region

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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E032/E914

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.

Card 4/4

KUZMIN, A. D., KOSCHENKO, V., SALOMONOVICH, A.

"Radio emission of the Moon on 10 cm."

paper presented at the International Astronomical Union Symposium on the Moon, Leningrad, USSR, 6-8 Sec 1960.

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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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E032/E514

Observations of Discrete Sources of Radio Emission on 9.6 cm Wavelength

Acknowledgments are expressed to the following persons who took part in building the apparatus and in obtaining the data: G. G. Basistov, N. F. Il'in, V. N. Koshchenko, L. A. Levchenko, S. K. Palamarchuk and V. I. Pushkarev. Acknowledgment is also expressed to D. V. Kovalevskiy who organized the programme for the radio telescope during the observations. There are 2 tables and 7 references: 4 Soviet and 3 non-Soviet.

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

SUBMITTED: May 14, 1960

Card 2/2

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S/020/60/132/01/21/064
B014/B014

AUTHORS: Vitkevich, V.V., Kuz'min, A.D., Sorochenko, R.L., Udal'tsov, V.A.

TITLE: Radioastronomical Observations of the Second Soviet Cosmic Rocket

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 1, pp. 85-88

TEXT: The frequently used method of radiointerference was employed for observing radio signals of the second Soviet cosmic rocket. The angular coordinates of the container were measured by means of the scientific instruments, furthermore the power of the signals received and its variations with time. A buzzer signal was used because of the increased stability of the instruments, the first and second heterodyne were stabilized by means of quartz. The distance between the antennas of the radiointerferometer, which were directed to the east, was 175.9 m. The angle between the perpendicular on the line connecting the antennas and the direction to the signal source was measured by means of the radiointerferometer. Formula (1) is given for the determination of this angle, and formula (3), in which the Doppler effect is considered, is derived for the azimuth of the signal source. The radiointerferometer is adjusted according to

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80050

Radioastronomical Observations of the Second Soviet Cosmic Rocket

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the intensity of cosmic radio sources. This system permitted exact determination of the moment at which the Soviet rocket hit the Moon, as well as of the place at which the container is located. Fig. 1 shows a copy of the recorded signal in the final stage of the rocket's flight to the Moon. It is shown that the recording lost its sinusoidal character (caused by interferences) as soon as the container hit the Moon. The rocket reached the Moon on September 14, 1959, 0 h 2 min 22 sec. The place of the container was established from formula (3) and is shown in Fig. 3. The power of the signal received was determined by comparing it with the intensity of the cosmic radio source of Cygnus-A. Fig. 3 further illustrates recordings made during the last days before the arrival of the rocket on the Moon. Periodic intensity variations of 45 seconds, 45 minutes, and 10 - 13 minutes were observed. In this connection the authors refer to the periodic variation in the orientation of the container and to the Faraday effect detected in the ionosphere. There are 3 figures, 1 table, and 8 references, 7 of which are Soviet.

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

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APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000928020(

mill balls, bearing rings, bushings and various periodic shapes such as crankshafts. The ball- and gear-rolling processes developed by TsNIITMASh are considered a major Soviet achievement. Ball-rolling is said to be replacing the manufacture of balls by pressing, increasing productivity two to seven times, and saving 10 to 25 percent in expensive alloyed steel. Gear rolling is a current development project in the USSR. Rolled-gears are reported to have been successfully produced to grade 2 accuracy, with a class 7-10 surface finish. Methods for determining rolling forces, stresses, moments and power, based on modern concepts of the theory of plasticity and strength of materials are discussed, and formulas derived. The author states that the mechanical properties of parts press formed, or machined from periodic rolled stock, are considerably higher than those made from conventional plain rolled stock, not to mention a 20 to 30 percent saving in material. The development of the theoretical principles and technological processes of cross-rolling and helical cross rolling in the USSR is said to have been carried on intensively since 1942. This theory was developed by V. S. Smirnov on the basis of experiments conducted at the Ural'skiy politekhnicheskiy institut (Ural Polytechnic Institute) and later at the Leningradskiy politekhnicheskiy institut (Leningrad Politechnic Institute). The development of machinery and equipment for cross rolling and helical cross rolling was supervised by A. I. Tselikov at the TsNIITMASh - Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machinery).

22310
S/107/61/000/007/001/002
D201/D304

3,1720 (1041, 1126, 1129)

AUTHORS: Kuz'min, A. D. 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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Radioastronomical observations of Venus

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/^{o}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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Radioastronomical observations of Venus

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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Radioastronomical observations of Venus

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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Radioastronomical observations of Venus

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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X

26658
S/560/61/000/007/002/010
E032/E114

3.2300 (1062,1080)

AUTHORS: Vitkevich, V.V., Kuz'min, A.D., Sorochenko, R.L., and Udal'tsov, V.A.

TITLE: Results of radio-astronomical observations obtained with Soviet space rockets

PERIODICAL: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli, No.7, Moscow, 1961, pp. 23-31

TEXT: An important problem in satellite and rocket experiments is the determination of the coordinates of the space vehicles. Since the satellites and rockets usually carry a stabilized transmitter, the problem is reduced to the determination of the position of the radio source and is analogous to the radio-astronomical problem of the determination of the angular coordinates of discrete sources. Such determinations are usually carried out by the radio-interferometer method. The present authors have used this method in the observation of the radio signals from the first, second and third Soviet space rockets. The use of radio astronomical methods has enabled them to measure the intensity of the signals as well. The observations were carried out on 183.6 Mc/s. The apparatus and the experimental
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Results of radio-astronomical S/560/61/000/007/002/010
E032/E114

method employed are described by the present authors in Ref.1 (Radiotekhnika i elektronika, 1961). The impact of the second space rocket container on the lunar surface occurred on September 14, 1959, at 0 hr 02 min 22±1 sec (this time is corrected for the time of propagation of the signal). The selenographic coordinates of the centre of the region of impact were found to be: latitude 30°, longitude -3° (crater Archimedes). During the observations of the first and second space rockets use was made of antennas with horizontal polarization. It is clear from the records obtained that in addition to a "quasi-sinusoidal" intensity variation due to interference there were also faster changes, which were apparently due to the rotation of the container. The period of these changes was 30-50 sec for the first and 40-60 sec for the second rocket. Comparisons of the records of signals from Soviet space rockets with those for known discrete sources of radio emission were used to estimate the intensity of the signal throughout the entire period of observations. The Cyg A source was used for the comparison. Figs. 4 and 5 show the variations in the intensity of the signals (slow component) in units of the power reduced to an isotropic emitter at the distance of the
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Results of radio-astronomical S/560/61/000/007/002/010 E032/E114

rocket. A consideration of these curves shows that in addition to the fast changes mentioned above there were also slower variations in the signal from the first space rocket (characteristic periods 8-12 min and 40-60 min). In the case of the second rocket there was a period of 45 min, reducing to 10-13 min. These changes may be due to the rotation of the container and the Faraday effect in the earth's atmosphere. In the case of the third rocket antennas with both horizontal and vertical polarization were employed. Typical records are reproduced. Analysis of the intensity records with two mutually perpendicular polarizations showed that there was signal fading on October 4, 5, 6, 12 and 17, 1959, with a period of about 3 min. In addition there was a signal variation reducing the amplitude to about 50% which had a period of about 1.5 min. These variations are apparently due to the rotation of the automatic inter-planetary station. There was some evidence that there was a further variation with a period of 20-30 min, and this may be due to the Faraday effect. The energy flux p was calculated from the expression

$$p = j \Delta f \cdot m$$

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Results of radio-astronomical S/560/61/000/007/002/010
E032/E114

where j is the energy flux from a discrete source with a continuous spectrum, Δf is the bandwidth of the receiver used to record the discrete source, and m is the ratio of the space-rocket to discrete-source signal. The emitted power P was calculated from:

$$P = p4\pi R^2$$

where R is the distance from the earth (isotropic source emitting equally in both polarization components).
There are 7 figures and 7 references: 2 Soviet and 5 English.
The four most recent English language references read:

Ref.4: P. Moore, Nature, V.184, 502, 1959.
Ref.5: H.P. Wilkins, Nature, V.184, 502, 1959.
Ref.6: G. Fielder, Nature, V.185, 11, 1960.
Ref.7: G. Whitfield, Paris Symposium on Radio Astronomy, Stanford, California, 1959, p. 299.

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35243
S/035/62/000/002/013/052
A001/A101

3.1720 (1041, 1126, 1127)

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

TITLE: Radio observations of Venus on wavelength 9.6 cm

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 2, 1962, 43, abstract 2A375 ("Astron. tsirkulyar", 1961, apr. 30, no. 221, 3-5)

TEXT: This is a report on radio observation of Venus on wavelength 9.6 cm by means of a 22-m radio telescope of the Physical Institute imeni Lebedev, AS USSR. The authors present an example of recording the transit of Venus across the direction diagram of the radio telescope near the instant of inner conjunction of the planet on April 22, 1961. Brightness temperature amounted on some days to $\sim 1,000^{\circ}$K and was subjected to strong variations from one day to another. The authors hold that an essential part of the Venus radio emission in the 10-cm wavelength range is played by a non-thermal component; its source is, possibly, Venus radiation belts, similar to Earth's belts. There are 15 references.

M. Frolov

[Abstracter's note: Complete translation]

Card 1/1

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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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

Thermal radio emission from ... S/041/61/004/003/003/020
E 3/E435

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

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3,1720(1126, 1127, 1129) [illegible]/04/003/019/020

AUTHORS: Kislyakov, A.G., [illegible] A.Ye.

TITLE: Radio emission from Venus [illegible]

PERIODICAL: Izvestiya vysshikh u[illegible] Radiofizika, 1961, Vol.4, No.3, pp. [illegible]

TEXT: Observations of Venus were m[illegible] 1961, using the 22 m radio telescope of the Fizich[illegible] imeni P.N.Lebedev AN SSSR (Physics Institut[illegible] P.N.Lebedev AS USSR) in the 4 mm band. The method wh[illegible] employed has been described previously (Ref.1: A.D.Ku[illegible] Astron. zh., v.37, 297 (1960)). G[illegible] the planet was by optical observation with slow trailing [illegible]. The antenna temperature was determined by two me[illegible] the first was by inserting an absorbing wedge at [illegible] in the signal path. The error in the resulting [illegible] temperature was within ± 7%. The second method wa[illegible] of the signal with the atmospheric radiation. (The [illegible] absorption values for 4 mm waves are well know[illegible] second method was used as a check on the first. The m[illegible] in reducing the

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S/033/61/003/019/020

Radio emission from Venus ...

observations probably lies in the ... of the average temperature over the whole of the pl... In this connection, the halfwidth of the ma... was investigated and found to be 1°.6. The amount of ... the antenna was investigated by observing the Sun and ... The brightness temperature of Venus, averaged over ... was then found to be 390°K ± 120°K. There ... 3 Soviet-bloc and 1 non-Soviet-bloc. The ... English language publication reads as follows:

Ref.3: A.W.Straiton, C.W.Tolbert, P... 898 (1960).

ASSOCIATIONS: Fizicheskiy institut ... AN SSSR (Physics Institute ... AS USSR) Nauchno-issledovatel'... institut pri Gor'kovskom univ... Scientific Research Institute for Radioph... University)

SUBMITTED: May 9, 1961

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4

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

21659

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
E032/E514

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

SUBMITTED: May 19, 1960

Fig.1

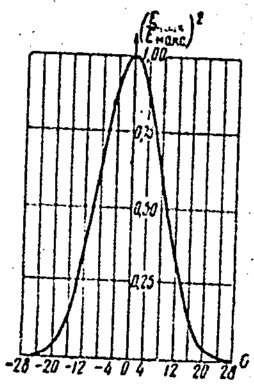
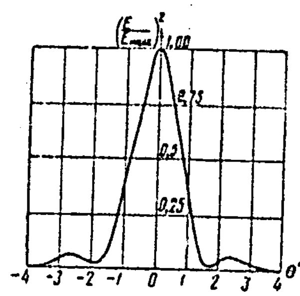


Fig.2



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28518
S/109/61/006/009/001/018
D201/D302

3,1750
6,4320

AUTHORS: Vitkevich, V.V., Kuz'min, A.D., Matveyenko, L.I., Sorochenko, R.L., and Udal'tsov, V.A.

TITLE: Radioastronomical observations of Soviet- cosmic rockets

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 9, 1961, 1420 - 1431

TEXT: This is a description of a specially designed radio interferometer with phase modulation, as used in tracking the first three Soviet space rockets. The principle of a two channel phase divergent reception was used to detect changes in the signal amplitude, due to relative changes of the position of transmitter with respect to the lobe of interference diagram. In receiving a signal with continuous spectrum the fluctuation sensitivity in units of temperature (T_a) of the antenna is given by the well known equation

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Radioastronomical observations ...

$$\delta T_a = \alpha_1 T_o F_e \sqrt{\frac{1}{\Delta f \tau}}, \quad (7)$$

where α_1 - a dimensionless factor depending on the properties of the receiver, T_o - standard ambient temperature; $F_e = (T_a + T_{in})/ /T_o$ - the equivalent input temperature determined by noise of the receiver; $T_{in} = (F_r - 1)$; F_r - noise factor of the receiver; T_a - antenna temperature; τ - time constant of the output cct; Δf - passband between input and detector. The bloc diagram of the receiver is shown; the operating frequency was 183.6 Mc/s, that of the transmitter in the rocket capsule. The interferometer had two parabolic antennae 8 x 18 and 11 x 28 m, spaced in the E-W direction by approximately 176 m. Total length of both antennae was 8 m. The antennae were reilluminated from their focal points by specially designed radiating systems, assuring best possible illumination for two linear polarizations perpendicular with respect to each other. Yu.P. Ilyasov participated in their design. A schematic of the

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illuminating system is also shown, the three resonant dipoles were connected by equal lengths of a PK-20 (RK-20) cable to a common feeder. The directional patterns and utilization factors of the antenna areas were determined from solar radiation. For both antennae, the area utilization factor was about 0.5. Phase modulation at a frequency 72 c/s was achieved by changing the phase by 180° by means of periodical variation of the electric length of the wall connecting the local oscillator with one of the mixers, so that the received signal was amplitude modulated at this frequency. The phase modulator was designed around a standard hybrid switch. The switching elements were light house diodes type 6Д3Д (6D3D) driven by the sinusoidal modulating voltage. The attenuation introduced did not exceed 2 db. The change in the diode slopes by way of changing the bias and the insertion of the modulator into the local oscillator circuit permitted the parasitic amplitude modulation of earlier systems to be reduced considerably. The modulator used permitted the radio meter with phase modulation to be changed into that with AM, this was achieved by suppressing the modulating voltage at one of the diodes. The signals were preamplified at UHF by amplifiers

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000928020(

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Radioastronomical observations ...

placed directly at the antennae. The noise factor of UNF preamplifiers was 5. The amplified signals from each antenna were changed after buffer stages to the 1st IF of 6.95 Mc/s and fed into two channels with a 90° phase shift between them. A double frequency conversion was used. The 190. 554 mc/s frequency of the first local oscillator was produced by a thermostatically controlled crystal oscillator working at 9,074 mc/s with subsequent multiplication by 21. Its relative instability was 10^{-6} and hence the passband of a monochromatic signal was chosen to be 2Kc/s. To secure reception with the signal frequency shifting due to the Doppler effect, step tuning within 8 Kc/s was provided formed by 5 resonant circuits detuned in 2 Kc/s steps. On top of the first L.O. could be continuously tuned within ± 3.2 Kc/s. For calibration purposes, when a under-passband is required, the second amplifier pass band could be switched from 2 to 10 Kc/s without affecting tuning and gain. The signal, detected by a synchronous detector, was taken from an RC output filter with time constant τ = 26 sec. This value permits achieving the required fluctuation sensitivity and in practive does not affect the interference amplitude. All power sup-

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S/109/61/006/009/001/018

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plies were stabilized with a stabilization factor of about 10^3. The signals were recorded on electronic automatic recorders type ЭПП-9 (EPP-09) monitored by one minute time markers. The experimental data of the receiver sensitivity are tabulated. The experimental sensitivity was about half that calculated from Eq. (7). The maximum sensitivity of the interferometer, corresponding to the minimum detected power levels, are also tabulated. In making final adjustments (M.V. Gorelova participated in the final adjustment method evaluation) constant and timevarying parameters had to be considered. The constant parameters are γ - angle between the horizontal plane and the projection of the base onto a vertical east-west plane, θ - angle between the east-west direction and projection of the base onto a horizontal plane and D - base of the interferometer distance between the antennae; are determined by fixed antenna geometry: $\eta = \varphi_n/\lambda$ on the other hand is determined by electrical lengths of the cables and phase characteristics of input stages and can vary with time. A geodesical survey gave the following results: D = 175.896 m; $\gamma = 2°44'$; $\theta = -14'$ so that the expression

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Radioastronomical observations ...

for the azimuth of the source is given by

$$A = 179^{\circ}46' + \arcsin\left[\frac{0.0093006}{\sin z}(n - \eta) - 0.047669 \operatorname{ctg} z\right], \quad (10)$$

where n - is the number of the lobe and z - the zenith angle of the source. The parameter η was determined from

$$\eta = \frac{t_r - t_{\Lambda\,source}}{T}, \quad (11)$$

where T - the period of the interference lobe, t_r - the calculated and $t_{\Lambda\,source}$ - the real instant at which the source passes through the maximum of the interference diagram. Owing to the finite value of the output cct time constant, the instant $t_{\Lambda\,source}$ at which the source crosses the maximum of the diagram does not correspond with t representing the maximum deflection of the seconding instru-

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ment. $\Delta\tau$ thus was introduced, as given by

$$\Delta\tau = t_{\Lambda} - t_{\Lambda source} = \tau[1 - \frac{4^2}{3}(\frac{\tau}{T})^2] \qquad (12)$$

in adjusting the arrangement. The above instrument and method of observations were applied to tracking the first, second and third Soviet- space rockets, launched January 2, September 12, and October 4, 1959, respectively; measuring their angular coordinates and measurements of the intensity of the received signal were also carried out. There are 8 figures, 3 tables and 11 references: 5 Soviet-bloc and 6 non-Soviet-bloc. The references to the 4 most recent English-language publications read as follows: G. Fielder. Nature, 1960, 185, 4705, 11; H.P. Wilkins, Nature, 1959, 184, 4685, 502; P. Moore, Nature, 1959, 184, 4085, 502; J.G. Davies, A.G.B. Lovell, Nature, 1959, 194, 4685, 501.

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

SUBMITTED: October 4, 1960

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89323
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}	$T_A^{\circ}K$	$p.10^{24}$, $W/m^2 cps$	θ
Tau A	05h31m.5	22°00'	40	[6]	[3'.4]
Orion	05h32m.8	-5°25'	24.5	3.6±0.8	5'.1±0'.5
Omega	18h17m.65	-16°15'	33.5	5±0.8	5'.8±0'.5
Cyg A	19h57m.75	40°35'	11.5	1.7±0.4	-
Cas A	23h21m.2	58°32'	34	5±1	4'

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

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

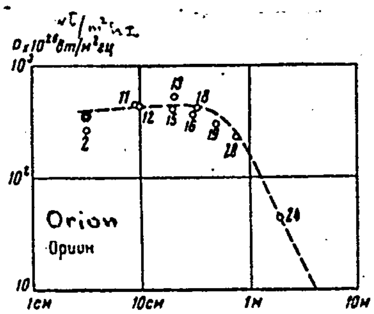
Card 3/5

E9323

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

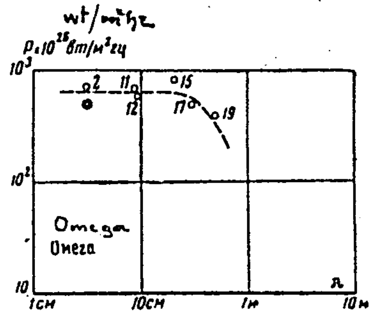
Observations of Some Discrete Radio Sources on 3.2 cm

Fig. 2a:



a

Fig. 2b:



б

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89323
S/033/61/038/001/006/019
E032/E314

Observations of Some Discrete Radio Sources on 3.2 cm

Fig. 2c:

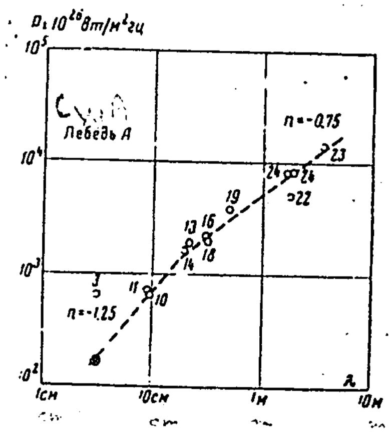
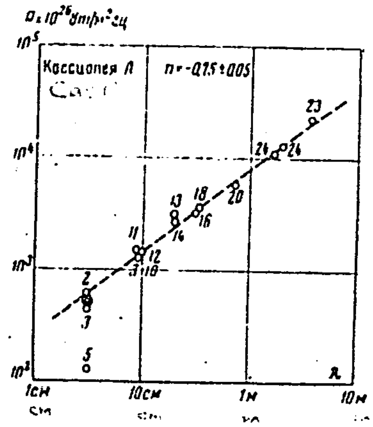


Fig. 2d:



Card 5/5

20885

3,1730 (1126,1127,1129)
6,9417
9,9840

S/033/61/038/002/009/011
E032/E414

AUTHORS: Kuz'min, A.D., Salomonovich, A.Ye. and Udal'tsov, V.A.

TITLE: On the Radio Emission of the Planetary Nebulae NGC 6853 and NGC 7293

PERIODICAL: Astronomicheskiy zhurnal, 1961, Vol.38, No.2, pp.373-375

TEXT: The present authors have made an attempt to detect the radio emission of NGC 6853 and NGC 7293 on 9.6 cm. The NGC 6853 nebula was examined at the end of 1958 with the 31 m radiotelescope of the Krymskaya stantsiya (Crimean Station) of FIAN. The above radiotelescope has been described by V.V.Vitkevich and V.A.Udal'tsov (Ref.2) and the radiometer has been described by A.D.Kuz'min and V.A.Udal'tsov (Ref.3). The radiometer had a sensitivity of 0°.5 at a time constant of 20 sec. It is estimated that the flux density of radio emission due to the NGC 6853 nebula on 9.6 cm must be less than 4×10^{-26} W m^{-2} cps^{-1}. The NGC 7293 nebula was examined with the 22 m radiotelescope of FIAN at the beginning of 1960. This radiotelescope has been described by A.Ye.Salomonovich (Ref.4). It is estimated that the

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20885

S/033/61/038/002/009/011
E032/E414

flux density for the above two nebulae on 9.6 cm turns out to be at least by an order of magnitude lower than that reported by F.D.Drake and H.T.Ewen (Ref.1) on 3.75 cm. Since the accuracy of the present results is said to be higher by an order of magnitude than the results reported by Drake and Ewen, it is suggested that the latter are incorrect. Using the upper limits for the flux density, the present authors estimated the emission measure ME, the electron density n and the mass M of the above two planetary nebulae. These three quantities are estimated from the following formulae

$$ME = 38 \cdot 10^{26} p \varphi^{-2}; \quad (1)$$

$$n = \frac{48}{\varphi} \sqrt{\frac{P \cdot 10^{26}}{R\varphi}}, \quad (2)$$

$$\frac{M}{M_{\odot}} = 4.8 \cdot 10^{-6} \varphi R^{2} \sqrt{\varphi R p \cdot 10^{26}}, \quad (3)$$

where φ is the angular diameter of the source in fractions of a degree and R is the distance in parsecs. These formulae are

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20885

S/033/61/038/002/009/011
E032/E414

On the Radio Emission ...

taken from G.Westerhout's paper (Ref.5). The estimates are summarized in the table. The angular dimensions of the nebulae which are quoted in the table are taken from B.A.Borontsov-Vel'yaminov's paper (Ref.6). The distances are taken from the latter paper and from the paper by I.S.Shklovskiy (Ref.7). There are 1 figure, 1 table and 7 references: 5 Soviet and 2 non-Soviet.

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

SUBMITTED: June 7, 1960

Card 3/4

20885

30822
S/033/61/038/005/010/015
E133/E435

3,1730 (1172)

AUTHOR: Kuz'min, A.D.

TITLE: The discrete source of radio emission $\alpha = 18^h53^m7$; $\delta = 1°16'$

PERIODICAL: Astronomicheskiy zhurnal, v.38, no.5, 1961, 905-911

TEXT: The 22 metre radio telescope of the FIAN has been used to study this source at 9.6 cm. It has been found to have the same dimensions in R.A. and Dec - 18' ± 3' or 20' ± 3' - depending on the method of computation. The flux density for a Gaussian brightness distribution is $(140 \pm 20) \times 10^{-26}$ W m^{-2} cps^{-1}. The table compares this with values obtained by other authors. The values obtained by G.Westerhout (Ref.3: Bull. Astr. Inst. Netherl., v.14, no.488, 215, 1958), B.Y.Mills, O.B.Slee, E.R.Hill, (Ref.9: Austral. J. Phys., v.11, 360, 1958) and G.R.Whitfield (Ref.11: Monthly Notices Roy. Astron. Soc., v.120, 6, 581, 1960) have been corrected by the author. This data can be represented by an equation of the form $p = A\lambda^n$ with $n = 0.4 \pm 0.1$. A source with similar structural characteristics is IC 443 which is believed to be the remnant of a type II supernova. Fig.2 compares the spectra

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30822
S/033/61/038/005/010/015
E133/E435

The discrete source of radio ...

of the two sources. IC 443 has a spectral index n = 0.5 ± 0.1. Assuming that this non-thermal radiation is due to relativistic electrons, it is possible to calculate the total electron energy of the radio source: as Burbidge has done for IC 443 (Ref.19: G.R.Burbidge, Paris Symposium on Radioastronomy, 1959). It is first necessary to know the distance to the object. Using I.S.Shklovskiy's method of distance determination for type II supernovae (Ref.20: Astron. zh., v.37, 369, 1960), a distance of 3500 pcs is obtained. This gives a radius of 9 pcs for the nebula. The radius of IC 443 is 12 pcs by the same method. The upper and lower frequency limits for the nebula (corresponding to the maximum and minimum electron energies) are taken to be 10^7 and 10^{10} c/s as in Ref.19. The source then radiates 2×10^{34} erg/sec as compared with 4×10^{33} for IC 443. The author next tries to estimate the magnetic energy of the nebula (assumed spherical). Assuming that the magnetic energy is equal to the kinetic energy of the particles, he derives a value for the field of 10^{-4} gauss. The total energy of the nebula is then 10^{50} erg, compared with 4×10^{-5} gauss and 1.2×10^{50} erg for IC 443.

4

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30822
S/033/61/038/005/010/015
The d› rete source of radio ... E133/E435

of the two sources. IC 443 has a spectral index $n = 0.5 \pm 0.1$. Assuming that this non-thermal radiation is due to relativistic electrons, it is possible to calculate the total electron energy of the radio source: as Burbidge has done for IC 443 (Ref.19: G.R.Burbidge, Paris Symposium on Radioastronomy, 1959). It is first necessary to know the distance to the object. Using I.S.Shklovskiy's method of distance determination for type II supernovae (Ref.20: Astron. zh., v.37, 369, 1960), a distance of 3500 pcs is obtained. This gives a radius of 9 pcs for the nebula. The radius of IC 443 is 12 pcs by the same method. The upper and lower frequency limits for the nebula (corresponding to the maximum and minimum electron energies) are taken to be 10^7 and 10^{10} c/s as in Ref.19. The source then radiates 2×10^{34} erg/sec as compared with 4×10^{33} for IC 443. The author next tries to estimate the magnetic energy of the nebula (assumed spherical). Assuming that the magnetic energy is equal to the kinetic energy of the particles, he derives a value for the field of 10^{-4} gauss. The total energy of the nebula is then 10^{50} erg, compared with 4×10^{-5} gauss and 1.2×10^{50} erg for IC 443.

4

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E133/E435

The discrete source of radio ...

This seems to confirm that the object is a type II supernova remnant. It might be expected that polarized radiation could be observed from such an object. It has been shown, however, that symmetrical objects do not produce polarized radiation (Ref.22: A.A.Korchak, S.I.Syrovatskiy, Astron. zh., v.38, 885, 1961). It would be interesting to search for an optical identification, but the probability of finding one is small. The results previously obtained by Yu.N.Pariyskiy (Ref.2: Izv. Gl. astron. observ. v. Pulkove, v.21, no.5, 45, 1960) are wrong as they are based on the assumption of thermal radiation. The author thanks I.S.Shklovskiy for valuable discussions. A.A.Korchak and S.I.Syrovatskiy are mentioned in the article for their contributions in this field. There are 3 figures, 1 table and 22 references: 5 Soviet-bloc and 17 non-Soviet-bloc. The four most recent references to English language publications read as follows: Ref.4: D.E.Harris, J.A.Roberts, Publs. Astron. Soc. Pacif., v.72, no.427, 1960; Ref.5: R.W.Wilson, J.G.Bolton, Publs. Astron. Soc. Pacif., v.72, no.428, 1960; Ref.11: as quoted in text); Ref.19: as quoted in text.

Card 3/4

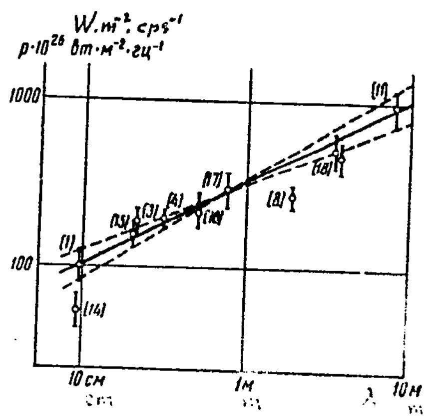
The discrete source of radio ...

30822
S/033/61/038/005/010/015
E133/E435

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

SUBMITTED: December 3, 1960

Fig.2.



Card 4/4

32437
S/033/61/038/006/006/007
E133/E435

3,1730 (1126, 1127, 1172)

AUTHORS: Kuz'min, A.D., Udal'tsov, V.A.

TITLE: The polarization of radio emission from the Crab Nebula in the 10 cm waveband

PERIODICAL: Astronomicheskiy zhurnal, v.38, no.6, 1961, 1114-1115

TEXT: The authors have communicated observations of the polarization of Crab Nebula in 9.6 cm range previously (Ref.1: Astron. zh., v.36, 1959, 33; Astron. tsirkulyar, no.187, 1957, 14) but corrections were not made in the earlier work for possible parasitic polarization in the apparatus. The observations were therefore repeated in May 1960 with a steerable 22 m radio telescope (Ref.2: A.Ye.Salomonovich, Radiotekhnika i elektronika, v.4, 1959, 2092). The data obtained were analysed by the method of least squares. The degree of polarization was found by comparison with a control signal which was 100% polarized. It was found that the degree of polarization in the Crab Nebula was 3.7 ± 0.5% and the position angle was 132 ± 5°. A comparison with two unpolarized sources (Cas A and Cyg A) indicated that the instrumental polarization did not exceed 0.5%. The data obtained with a stationary radiotelescope (Ref.1) may therefore be considered

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32437

The polarization of radio ... S/033/61/038/006/006/007
E133/E435

correct. The work reported there has been re-reduced to give a value of 3.2 ± 0.4% for the polarization and 137 ± 5° for the position angle. The average of these two results is therefore 3.5 ± 0.4% and 135 ± 3°. Observations were also made at a wavelength of 10.7 cm in June-July 1960, using a stationary radio-telescope of 31 m diameter (Ref.3: V.V.Vitkevich, V.A.Udal'tsov, Radiotekhnika i elektronika, v.2, 1952, 1548). It was found that the polarization was lower by 10% and the position angle decreased to 130 ± 3°. This agrees well with previous investigations. However, the changes in the position angle, noted in these investigations (Ref.4: C.H.Mayer, T.P.McCullough, R.M.Sloanaker, Report to the XIII General Assembly URSI, London, September 5-15, 1960) for wavelengths near 11 cm, appear to be improbable. There are 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc. The reference to an English language publication is quoted in the text.

ASSOCIATION: Fizicheskiy in-t im. P.N.Lebedeva, Akademii nauk SSSR (Physics Institute im. P.N.Lebedev, AS USSR)

SUBMITTED: February 10, 1961

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4

32438

3,1720 (1041, 1126, 1127)

S/033/61/038/006/007/007
E133/E435

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

TITLE: Radio observations of Venus in 1961

PERIODICAL: Astronomicheskiy zhurnal, v.38, no.6, 1961, 1115-1117

TEXT: Observations of Venus were made with the 22 m radio-telescope at wavelengths of 4 mm (Ref.2: A.G.Kizlyakov, A.D.Kuz'min, A.Ye.Salomonovich, Izv. vuzov, Radiofizika, v.4, no.3, 1961, 573), 8 mm and 9.6 cm (Ref.8: A.H.Barrett, Astrophys. J., v.133, no.1, 1961, 281) from the middle of March to the beginning of June 1961. Observations were also made at 3.3 cm from the end of May to the middle of July. At 4 and 8 mm, and at 3.3 cm, the brightness temperature increased continuously with the area of disc illuminated. The minimum temperatures found were 390 ± 120°K at 4 mm and 374 ± 75°K at 8 mm. These occurred before inferior conjunction. At 9.6 cm, the brightness temperature changed irregularly from day to day by large amounts. The brightness temperature averaged over the disc was also greater than at the shorter wavelengths being about 680°K. In agreement with American measurements (Ref.4: C.H.Mayer, T.P.McCullough,

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E133/E435

Radio observations of Venus ...

R.M.Sloanaker, Astrophys. J., v.127, 1, 1958, 1; Ref.5: C.H.Mayer et al, Report to the XIII General Assembly URSI, London, 1960; Ref.6: L.E.Alsop, J.A.Giordmaine, C.H.Mayer, C.H.Townes, Astron. J., v.63, 1958, 301), the brightness temperature of the night side of Venus, at the longer wavelength, was about 600°K. At the shorter wavelengths it was about 400°K. It seems unlikely that the temperature of the surface on the daylight side of Venus can be at a higher temperature than about 750°K. The fact that the emission at all the shorter wavelengths shows similar characteristics indicates that the gas pressure at the surface of Venus cannot exceed 5 atm (assuming that the atmosphere is composed of CO_2). The methods which have been suggested by the present authors (Ref.9: Astron. zh., v.37, no.2, 1960, 297) can be used to show that the direction of rotation of Venus is direct and the period of rotation, though longer than that of the Earth, is less than the orbital period. The irregular component of variation at 9.6 cm must be due to the ionosphere of Venus. The maximum brightness temperature measured at this wavelength was about 1000°K. This requires a high electron density ($\sim 5 \times 10^8 cm^{-3}$),

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32428

Radio observations of Venus ...

S/033/61/038/006/007/007
E133/E435

With a magnetic field 1/30 that of the Earth (Ref.7: D.E.Jones, Planetary and Space Sci., v.5, no.2, 1961, 166) this could be obtained from solar corpuscular streams. More improbably, it could be produced from meteor streams, but these would have to be 3 to 4 orders of magnitude greater than on the Earth. The observations at the 4 mm wavelengths were carried out by the Aspirant of NIRFI, A.G.Kislyakov with the apparatus developed at NIRFI. There are 10 references: 4 Soviet and 6 non-Soviet-bloc. The four most recent references to English language publications Ref. 4,5,7 and 8 are quoted in the text.

ASSOCIATION: Fizicheskiy in-t im. P.N.Lebedeva, Akademii nauk SSSR (Physics Institute im. P.N.Lebedev, AS USSR)

SUBMITTED: September 15, 1961

Card 3/3

27875

S/020/61/140/001/011/024
B104/B109

3.1720

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

TITLE: The 8-mm radio-emission from the Taurus-A region

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 1, 1961, 81-83

TEXT: In March and April, 1961, the authors systematically investigated the discrete source of 8-mm radio-emission from the Taurus-A region with the 22-m radiotelescope (directional diagram approximately 2mm, sensitivity 1.5° K) of the Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute imeni P. N. Lebedev AS USSR). This radio-emission was observed for the first time on August 21, 1959. Measurements were carried out with a fixed antenna, the direction of which was adjusted according to the radio-emission of Venus. The records of 21 measurements were averaged. Two sources of radio-emission were found, the first of which is well known. Its right ascension is $\alpha_{1950} = 5^h31^m35^s \pm 05^s$. The mean antenna temperature of this source is 4.5°K ± 10%, its apparent diameter is

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S/020/61/140/001/011/024
B104/B109

The 8-mm radio-emission from...

estimated at 4.5 ± 1'. The radiation density is estimated to be $500 \cdot 10^{-16}$ w.m^{-2}.cps^{-1} ± 2.5 %. Luminance temperature is 6°K ± 10 %. In all measurements, a second radiation source was found. The right ascension of this new source is $\alpha_{1950} = 5^h 32^m 10^s \pm 6^s$. Its apparent diameter is 2'30", and its antenna temperature is 2.8°K ± 10 %. The luminance temperature of the new source is estimated to be 7°K ± 25 % and its radiation density at $130 \cdot 10^{-26}$ w.m^{-2}cps^{-1} ± 25 %. As there are no data available on any centimeter, decimeter, or meter radio-emission from this region, the authors assume this 8-mm radio-emission to be of thermal origin. The intensity of the new source discovered is ME = $2.7 \cdot 10^6$. The absence of visible optical nebulae is taken as an indication that the visible intensity does not exceed 400. Therefore, the total absorption from the earth to the source is higher than 8^m7. Using data of P. P. Parenago (Astr. zhurn., 22, no. 1-3, 200 (1945)), the distance between the earth

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The 8-mm radio-emission from... S/020/61/140/001/011/024 B104/B109

and the source of radio-emission exceeds 3.8 kiloparsec. The linear dimension 2S of the source is estimated at 2S > 3 parsec, and the electron density N_e at $N_e < 10^3$ cm^{-3} and $M/M_\odot > 400$. Hence this radiation source is similar to the nebulae NGC 1976 and NGC 6618. There are 2 figures and 5 references: 3 Soviet and 2 non-Soviet. The references to English-language publications read as follows: W. Baade et al., Astrophys. J., 119, 206 (1954); G. R. Whitfield, Month. Not. Roy. Astron. Soc., 117, no. 6, 680 (1957).

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

PRESENTED: May 8, 1961, by D. V. Skobel'tsyn, Academician

SUBMITTED: April 24, 1961

Card 3/3

KUZMIN, A. D., SALOMONOVICH, A. Ye.

"The Results of the Venus Radio Astronomical Observations Carried out at the P N Lebedov Physical Institute"

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

KUZ'MIN, A.D.

BOBROV, M. S., Astronomical Council, Academy of Sciences USSR [1960] - "Optics and geometry in the matter of Saturn's rings"

PROKOF'YEV, Vladimir K., Crimean Astrophysical Laboratory imeni G. A. Sheyn [1962] - "On the presence of oxygen in the atmosphere of Venus"

SALOMONOVICH, A. Ye., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR, and KUZ'MIN, Arkadiy D., Radio Astronomy Laboratory, Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR - "Observations of the radioemission of Venus and Jupiter on the wave of 8 mm."

SALOMONOVICH, A. Ye., KUZ'MIN, Arkadiy D., and KISLYAKOV, A. G. - "Radioemission of Venus on the wave of 4 mm."

SALOMONOVICH, A. Ye., KUZ'MIN, Arkadiy D., BIBINOVA, V. P., and SHAVLOVSKIY, I. V. - "Observations of the radioemission of Venus and Jupiter on the wave of 3.3 cm."

SALOMONOVICH, A. Ye., and KUZ'MIN, A. D. - "Radioemission of Venus on the wave of 9.6 cm."

SALOMONOVICH, A. Ye., and KUZ'MIN, A. D. - "Results of the observations of radioemission of Venus in 1961"

SHARONOV, Vsevolod V., Director, Astronomical Observatory, Leningrad State University [1961 position] - "Probable state of the surface and atmosphere of the planet Mars according to photometric and colorimetric data"

VSEKHSVYATSKIY, Sergey K., Head of the Chair of Astronomy, Kiev State University [1961 position] - "Nature of Saturn's rings and signs of the existence of a ring around Jupiter"

YEZERSKIY, V. I., and BARABASHEV, N. P., Director, Kharkov Astronomical Observatory, Kharkov State University [1960 position] - "Optical properties of the atmosphere and surface of Mars according to photometric and spectrophotometric observations carried out at the Kharkov University Observatory"

eport to be submitted for the 11th Intl. Astrophysics Symposium, Belgian nst. of Astrophysics, Cointe-Sclessin, Belgium, 9-11 Jul 1962.

43835

S/504/62/017/000/003/007
I046/I246

AUTHOR: Kuz'min, A.D.

TITLE: Results of observations of some discrete sources of radioemission on the 9.6 cm wave

SOURCE: Akademiya nauk SSSR. Fizicheskiy institut. Trudy, v. 17. Moscow, 1962. Radioastronomiya, 84-114

TEXT: This paper is a catalog of 50 out of 56 discrete radiosources measured on the 9.6 cm wave with the 22 m radiotelescope (January-April 1960) at the Okskaya nauchnaya stantsiya FIAN (the Oka Research Station PhIAS) (Ref.1: A.D.Kuz'min, K.T.Levchenko, R.I.Noskova, A.Ye.Salomonovich. Astronomicheskiy zhurnal, 1960, 37, No. 6, 975). Each source is identified according to optical and radio classification and its coordinates are given (right ascension, declination, galactic). Also given: angular size, antenna temperature, radiation flux density, brightness temperature, spectral index. For 10 of those objects, the mass, the linear dimensions, and the electron density is given, and the probable exciting star is listed for each of the emission nebulae; the distance to these 10 nebulae is calculated from radiation data. Spectra are given of 21 thermal and

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14 [illegible] discrete sources...

NGC [illegible] sources. Special measurements of the 9.6 cm radioemission of [illegible] m radiotelescope, 1959) and of NGC 7293 (22 m radiotelescope, 1960) show that their flux densities are less than 4.10-26 watt.m-2cycle-1 and 8.10-26 watt.m-2.cycle-1, respectively. These results are at variance with Ref. 67 (F.D.Drake and H.I.Ewen. Proc. IRE, 1958, 46, N 1, 53) and in agreement with Ref. 70 (J.G.Bolton, Publ. Astron. Soc. of Pacific, 1960, 72, N 429). There are 8 figures and 4 tables.

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R0009280

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33421

S/033/62/039/001/002/013
E032/E114

3,1730 (1041,1126,1127)

AUTHOR: Kuz'min, A.D.

TITLE: The spectra of discrete sources of radio emission observed with the 22 metre radio telescope of the FIAN

PERIODICAL: Astronomicheskiy zhurnal, v.39, no.1, 1962, 22-28

TEXT: It is pointed out that published information on the radio emission of discrete sources in the centimetre range is rather limited and frequently contradictory. In view of this the present author et alia have used the 22-metre radio telescope of FIAN to determine the radio emission of a number of discrete sources on 9.6 and 3.2 cm. These results were obtained in January-June 1960 and were reported in previous papers (Ref.1: A.D. Kuz'min, M.T. Levchenko, R.I. Noskova, A.Ye. Salomonovich, Astron.zh., v.37, 975, 1960. Ref.2: A.M. Karachun, A.D. Kuz'min, A.Ye. Salomonovich, Astron.zh., v138, 83, 1961). Fifty discrete sources were observed on 9.6 cm; on 3.2 cm the number was 5. In the present paper the

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33421
S/033/62/039/001/002/013
E032/E114

The spectra of discrete sources ...

author compares the above Soviet work with the results obtained by other workers for different wavelengths. Western published work is critically reviewed and in some cases the published flux densities are suitably corrected. Thus, for example, all the results of G. Westerhout (Ref.14: Bull. Astron. Netherl., v.14, no.488, 1958) are multiplied by 0.86 in order to exclude the systematic error pointed out by P.G. Mezger (Ref.13: Z.Astrophys., v.46, 234, 1958). The results of this analysis are then used to plot the spectra of two thermal and all the non-thermal sources which have been observed so far. The table gives a comparison of the values obtained for the spectral index n of the non-thermal sources with the values reported by D. E. Harris and J. A. Roberts (Ref.15: Publs. Astron. Soc. Pacif., v.72, no.427, 237, 1960) and G.R. Whitfield (Ref.40: Monthly Notices Roy. Astron. Soc., v.117, 680, 1957).
There are 3 figures, 1 table and 40 references: 5 Soviet-bloc and 35 non-Soviet-bloc. The four most recent English language references read as follows:
Ref.10: R.M. Sloanaker, J.H. Nichols, Astron.J., v.65, 1278, 109, 1960.

Card 2/3

33421

The spectra of discrete sources ... S/033/62/039/001/002/013
E032/E114

Ref. 16: R.W. Wilson, J.G. Bolton, Publs. Astron. Soc. Pacif., v.72, no.428, 1960.
Ref. 25: P. Leslie, Observatory, v.80, 23, 1960.
Ref. 33: G.R. Whitfield, Monthly Notices Roy. Astron. Soc., v.120, 581, 1960.

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

SUBMITTED: February 10, 1961

Card 3/5

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R00092802

KARDASHEV, N.S.; KUZ'MIN, A.D.; SYROVATSKIY, S.I.

Nature of the emission of radio galaxy Cygnus-A. Astron.zhur. 39 no.2:216-221 Mr-Ap '62. (MIRA 15:3)

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(Galaxies) (Radio astronomy)

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Identification of exciting stars and the determination of the parameters of emission nebulae from radio-astronomy data. Astron.zhur. 39 no.2:241-246 Mr-Ap '62. (MIRA 15:3)

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

TITLE: The radio emission of Venus at 4 mm wavelength

PERIODICAL: Astronomicheskiy zhurnal, v.39, no.3, 1962, 410-417

TEXT: The intrinsic radio emission of Venus is expected to yield important information on the temperature of the planet, on the nature of its surface, on the composition of its atmosphere and on some of its rotational properties. All previous measurements are said to have been carried out at wavelengths greater than 0.8 cm. In March - May, 1961, the 22-metre radio telescope of the Fizicheskiy institut imeni P.N. Lebedeva AN SSSR (Physics Institute imeni P.N. Lebedev, AS USSR) was used to observe the radio emission of Venus at 4 mm. An account of the method of reduction of the observations is given and it is estimated that the RMS error in the measured intensity was ± 30%. The results obtained are shown in Figs. 4 and 5. (Fig.4: Antenna temperature as a function of time; the arrow indicates inferior conjunction. Fig.5: Brightness temperature of Venus as a function of time).

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Observations of radio emissions of Venus and Jupiter on 8 mm. wavelength. Astron.zhur. 39 no.4:660-668 Jl-Ag '62. (MIRA 15:7)

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(Radio astronomy) (Venus (Planet))
(Jupiter (Planet))

KUZMIN, A.D.

Radioastronomical research of Venus (USSR)

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Radio emission of discrete sources in orion and Omega in the microwave band. Astron.Tsir. no. 260:1-4 S '63. (MIRA 17:5)

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Measuring the radio emission spectrum of the night side of Venus in the microwave band. Izv. vys. ucheb. zav.; radiofiz. 6 no.5: 1054-1056 '63. (MIRA 16:12)

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An ionospheric model of Venus. Izv.vys.ucheb,zav.; radiofiz. 6 no.6:1090-1097 '63. (MIRA 17:4)

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