NIKOL'SKIY, G.M.

Predicting the form of the solar corona for June 20, 1955.
Astron.tsir.no.160:11-12 Je'55. (MLRA 8:12)

1. Kafedra astronomii Kiyevskogo universiteta
(Sun--Corona)

NIKOL'SKIY, G.M.

Form of the solar corona. Astron.zhur.33 no.1:84-86 Ja-F '56.
(MLRA 9:6)

1.Kafedra astronomii Kiyevskogo gosudarstvennogo universiteta.
(Sun--Corona)

NIKOL'SKIY, G.M.

Polar ray systems of the corona of 1954. Astron.zhur.33 no.1: 87-92 Ja-F '56. (MLRA 9:6)

1.Kafedra astronomii Kiyevskogo gosudarstvennogo universiteta.
(Sun--Corona)

NIKOL'SKIY, G.M.

The electron component of the zodiacal light. Astron.zhur.33 no.3: 410-413 My-Je '56. (MLRA 9:10)
(Zodiacal light)

NIKOL'SKIY, G.M.

On coronal rays. Astron. zhur. 33 no.4:588-598 Jl - Ag '56. (MLRA 9:11)

1. Kafedra astronomii Kiyevskogo gosudarstvennogo universiteta.
(Sun--Corona)

VSEKHSVYATSKIY, S.K.; NIKOL'SKIY, G.M.

Observations in Kiev of the partial solar eclipse of December 14, 1955. Astron.tsir. no.166:2-3 Ja '56. (MLRA 9:7)

1.Kafedra astronomii Kiyevskogo gosudarstvennogo universiteta imeni T.G.Shevchenko.
(Eclipses, Solar--1955)

NIKOL'SKIY, G.M.

Observation of the corona in continuous spectra without an eclipse. (MLRA 9:9)
Astron.tsirk. no.167:12-14 F '56.

1.Kafedra astronomii Kiyevskogo universiteta.
(Sun--Corona)

NIKOL'SKIY, G.M.

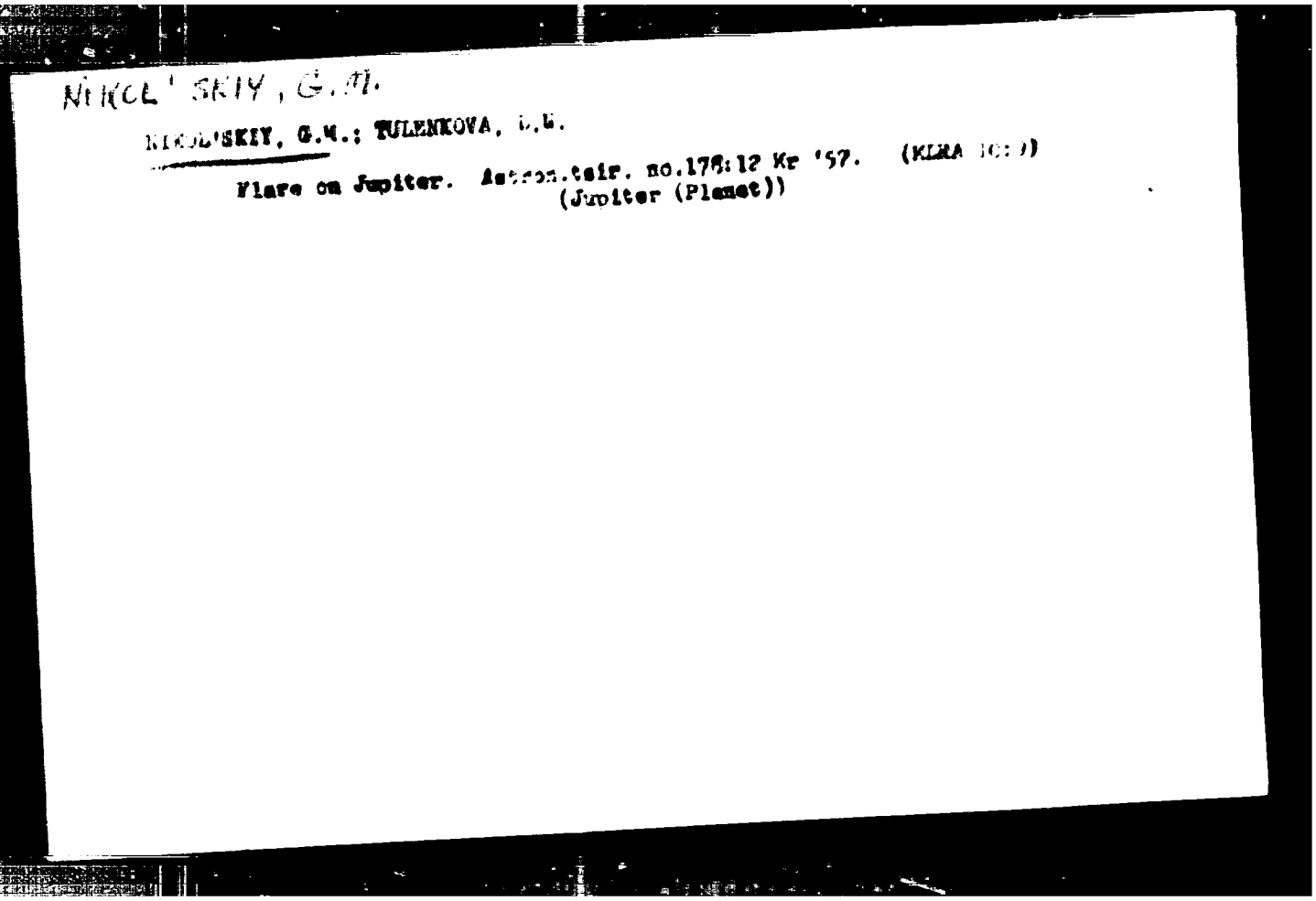
Aurora borealis observed near Alma-Ata. Astron.tsir. no.185:24 O '57. (MIRA 11:4)

1.Astrofizicheskiy institut AN KazSSR, Alma-Ata.
(Auroras)

NIKOL'SKIY, G.K.

Electrophotometric observations of aurora borealis of September 29, 1957, near Alma-Ata. Astron.tsir. no.186:23-24 N '57. (MIRA 11:4)

1. Astrofizicheskiy institut AN KazSSR.
(Aurorae)



NIKOL'SKIY, G.M.

NIKOL'SKIY, G.M.; TULENKOVA, L.E.

Flare on Jupiter. Astron.tsir. no.178:12 Kr '57. (KLRA 10:1)
(Jupiter (Planet))

NIKOL'SKIY, G.M.

Comments on A.G. Masevich's article "Luminosity function of main sequence stars and its interpretation." Astron.zhur. 34 no.3:493 My-Je '57. (MLRA 10:7)
(Stars--Magnitude)

Comments by Nikol'skiy on the paper by A.G. Masevich "Luminosity function for stars of the main sequence" and author's reply. (Cont.)

ent time, and N is the number of stars in the Galaxy. Substituting for $\varphi(M)$ Masevich obtains:

$$22\,\frac{nt}{N} = \frac{1}{L} - \frac{1}{L_o}$$

where L is the luminosity. Masevich argues as follows: if in the process of evolution a star loses mass and its luminosity decreases, then using eq. (2) it is possible to estimate the number of stars formed in time t . If the evolution takes place at constant mass, then according to eq. (2) its luminosity should increase. However, it follows from equation (2) that when L_o is less than L , n is always negative. This absurd result shows, according to Masevich, that evolution is only possible with a loss of mass. He further considers that the negative sign indicates the exit of stars, evolving at constant mass, from the main sequence.

However, the present writer points out that the R.H.S. of eq. (1) is essentially positive. In considering evolution

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NIKOL'SKIY, G. M.

"Solar Corona of February 25, 1952"

"Photometry of Coronal Rays and Corpuscular Streams"

"Polar Radial Systems of the 1954 Corona"

Vsekhsvyatskiy, S. K. and G. M. NIKOL'SKIY

"Structure of the Solar Corona of June 30, 1954"

(Total Eclipse of the Sun, February 25, 1952 and June 30, 1954, Transactions of the Expedition to Observe Solar Eclipses) Moscow, Izd-vo AN SSSR, 1958. 357 p.

00405
SOV/169-59-4-4214

3.1520

Translation from: Referativnyy zhurnal, Geofizika, 1959, Nr 4, p 140 (USSR)

AUTHOR: Nikol'skiy, G.M.

TITLE: On the Problem of the Night Sky Glow in the Red and Green Spectral Lines

PERIODICAL: Izv. Astrofiz. in-ta AS KazSSR, 1958, Vol 7, pp 55 - 57 (Engl. Res.)

ABSTRACT: The relative intensity of the lines [OI] 5577, 6300 Å and NaI 5893 Å in the spectrum of the night sky is determined by the spectrographic method. Unter the assumption that the glow is excited in the F_2 layer and that electronic impact causes the excitation, the author solves the equation of the microsteadiness. In this way, the population of the $^1S_2$ level is obtained much lower than that corresponding to the relative intensities observed. On this basis the author draws the conclusion that the glows in 5577 and 6300 Å occur at different altitudes and the mechanisms of their excitation are different.

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SOV/169-59-4-4214

On the Problem of the Night Sky Glow in the Red and Green Spectral Lines

While 6300 Å line is excited as a result of a direct electronic impact, processes based on the dissociation of the molecular oxygen may appear rather as the excitation mechanism of 5577 Å-line.

L.M.P.

Card 2/2

NIKOL'SKIY, G.M.

Nature of the red spot [with summary in English]. Izv. Astrofiz. Inst. Kazakh. SSR 7:53-64 '58. (MIRA 11:7)
(Jupiter(Planet))

SOV/33-35-4-17/25

3(1)
AUTHOR: Nikol'skiy, G.M.

TITLE: On the Possibility of Absorption of Solar L_α Radiation by the Interplanetary Medium (O vozmozhnosti pogloshcheniya L_α radiatsii solntsa mezhplanetnoy sredoy)

PERIODICAL: Astronomicheskiy zhurnal,1958, Vol 35, Nr 4, pp 657-659(USSR)

ABSTRACT: The author determines the concentration of neutral hydrogen in the interplanetary space to $n_H \sim 1 \div 10$ cm^{-3} for $n_e \sim 10^2 \div 10^3$cm^{-3} and $T \sim 10^4$. The interplanetary gas possesses in the L_α line a high optical thickness between earth and sun. There are 9 references, 2 of which are Soviet, 4 German, 2 American, and 1 English.

ASSOCIATION: Institut astrofiziki AN Kaz SSR (Astrophysical Institute AS Kazakh SSR)

SUBMITTED: December 14, 1957

Card 1/1

3(1) SOV/33-36-3-12/29

AUTHOR: Nikol'skiy, G.M.

TITLE: On the Coronal Emission in λ 5694

PERIODICAL: Astronomicheskiy zhurnal, 1959, Vol 36, Nr 3, pp 477-480 (USSR)

ABSTRACT: The author tries to examine experimentally the theory of Elwert [Ref 6,7] with respect to the emission of λ 5694 and λ 6374. For this purpose he uses the observations of the solar corona due to Waldmeier. A statistical treatment of these results confirms the theory of Elwert. Then the author gives a survey of several opinions on this domain, where he mentions especially the papers of I.S.Shklovskiy and G.S.Ivanov-Kholodnyy. The author is of opinion that the identification of the yellow line with Ca XV due to Edlen [Ref 1] is correct. The question of the ratio I_{5694}/I_{5446} remains unanswered.

There are 15 references, 5 of which are Soviet, 4 German, 2 Swiss, 1 Czechoslovak, and 3 American.

ASSOCIATION: Astrofizicheskiy institut Akademii nauk Kaz SSR (Astrophysical Institute of the AS Kazakh SSR)

SUBMITTED: June 2, 1958

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89069

S/555/60/007/000/007/007
B125/B201

3,1540 (1062,1128,1168)

AUTHOR: Nikol'skiy G. M.

TITLE: Corpuscular radiation of the Sun and zodiacal light

PERIODICAL: Voprosy kosmogonii, vm. 7, 1960, 181-212

TEXT: This is a report based upon results of the author's own studies and findings by other scientists. There are many physical theories concerning the possible nature of the corona. A paper by I. S. Shklovskiy provides a survey on the subject. The streamer structure of the solar corona is also the object of many studies which are directed, above all, to the thermal dissipation from the corona. A great number of astronomers' observations concerning the motion of matter in the direction of radiation has been conducted under the guidance of S. K. Vsekhsvyatskiy. Studies of the density along the rays revealed its monotonic course. Ye. A. Ponomarev is mentioned for having studied the stability of coronal rays. An attempt has been made to associate coronal polar rays with polar faculae. The limited lifetime of polar rays can be easily explained by the outflow of matter (10^{11} g/sec) from the corona. The thermal dissipation of the latter is dealt with in a

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Corpuscular radiation of ...

special section. The amount of dissipation is 10^9 g/sec (10^{33} protons/sec). The corpuscular radiation in the polar regions of the corona is dealt with separately. A very thorough discussion is made of papers by M. Waldmeier. Spectrographic and radio methods are discussed in connection with the estimation of gas concentration in the interplanetary space. V. G. Fesenkov is mentioned for having published observations of the zodiacal light. A theory on coronal dissipation has been worked out by S. B. Pikel'ner. Opinions differ as to the origin of the zodiacal light. I. S. Shklovskiy believes that cosmic matter surrounds the Earth as a ring, in much the same way as happens with Saturn. Observations of nocturnal light by rockets are discussed, and the kinetic temperature of interplanetary gas is considered. Since this gas absorbs corpuscular solar radiation, its energy increases. Therefore, its temperature will be $T \sim 10^4$-10^5 °K. Also, the thermal dissipation of the gas component of zodiacal light is considered. Interplanetary neutral hydrogen, which should absorb solar L_α radiation, cuts out a narrow line from this L_α line. There occurs, of course, an interaction between interplanetary particles and the gas. V. I. Morozov and V. G. Kurt are mentioned. There are 5 figures, 3 tables, and 52 references: 37 Soviet-bloc and 8 non-Soviet-bloc.

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S/030/60/000/010/011/018
B021/B058

AUTHOR: Nikol'skiy, G. M.

TITLE: Extended Plenum of the Commission for Solar Research

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, No. 10, pp. 104-105

TEXT: The Ordinary Plenum of the Commission for Solar Research of the Astronomicheskiy sovet Akademii nauk SSSR (Astronomy Council of the Academy of Sciences USSR) was held in Kiyev from May 30 to June 4, 1960. Papers on the study of solar physics by the observatories and scientific institutes of the USSR were discussed. Reports on processes in the chromosphere dealt with the distribution of atoms on the energy levels, elementary atomic processes, and problems of the structure of the chromosphere as well as results of the observations of chromosphere flares. The following lectures were delivered next: A. B. Severnyy, R. M. Shabanskiy, and I. M. Gordon dealt with theoretical problems of the physics of flares; S. I. Gonsarnk reported on the movement of the gas of the flare in connection with its magnetic field; A. T. Mesmyanovich analyzed its ray structure on the basis of photometric research of corona recordings;

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Extended Plenum of the Commission for Solar Research

S/030/60/000/010/011/018
B021/B058

G. S. Ivanov-Kholodnyy and G. M. Nikol'skiy analyzed the physical properties of the transition zone between chromosphere and corona; Ye. A. Ponomarev dealt with the corona theory from the point of view of gas kinetics; Ye Shi-khu-ey (Kryuskaya observatoriya - Krym Observatory) and S. O. Ohanhar reported on the spectrophotometric study of protuberances; V. Ye. Stepanov considered the great movements in the solar atmosphere on the basis of observations of magnetic phenomena on the sun; E. I. Mogilevskiy theoretically considered the process of the penetration of the magnetic field into the corona; V. I. Ivanchuk considered the possible connection of the variability of the general solar magnetic field with the escape of energy in the form of heat into the corona; V. V. Vitkevich, M. N. Gnevyshev, A. Ye. Salomonovich, G. B. Gel'freykh, and A. F. Dravskikh reported on studies of the radio frequency emission of the sun. I. S. Shklovskiy, V. I. Moroz, V. G. Kurt, S. K. Vsekhsvyatskiy, and E. R. Mustel' reported on problems of corpuscular radiation of the sun. Problems of observing the impending total eclipse on February 15, 1961 were dealt with by a special commission composed of representatives from observatories. The eclipse is to be observed from the Earth as well as from high-altitude planes.

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S/033/60/037/005/003/024
E032/E514

AUTHORS: Ivanov-Kholodnyy G S, Nikol'skiy G M and Gulyayev R A

TITLE: Ionization and Excitation of Hydrogen
I. Elementary Processes for the Upper Levels

PERIODICAL: Astronomicheskiy zhurnal 1960 Vol 37 No 5 pp. 799-811

TEXT: Elementary processes associated with quantum transitions, such as recombination, ionization, collisions of the first and second kind, emission etc. are frequently discussed in connection with astrophysical problems. The present paper is concerned with such elementary processes in hydrogen plasma in the light of modern data for the corresponding effective cross-sections. Particular attention is paid to the upper quantum levels. The first section of the paper is concerned with the phenomenon of pre-ionization. Thus a hydrogen atom cannot exist in a state with a large quantum number m when placed in an electric field since the latter reduces the height of the potential barrier and an electron at a certain level m_0 will thus become effectively free. The pre-ionization effect can also be associated with the

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S/033/60/037/005/003/024
E032/E514

Ionization and Excitation of Hydrogen I. Elementary Processes for the Upper Levels

perturbation of hydrogen atoms by free ions If the disturbing proton and the nucleus of the atom are at a distance r then the total potential energy of an electron in the field of these two nuclei is of the form

$$U(r) = -e^2 \left(\frac{1}{r} + \frac{1}{r_o - r} - \frac{1}{r_o} \right) \qquad (1)$$

This is illustrated in Fig.1 in which the dashed curves represent the undisturbed fields. If the total energy of the electron in the m-th level E_m is not smaller than the maximum height of the potential barrier $U(r_o/2) = -3e^2/r_o$ then charge transfer will take place and the electron will enter the potential well of the neighbouring proton. In a plasma characterized by an ion density n_i and, consequently mean inter-ionic distance $r_o \sim n_i^{-1/3}$ the above charge transfer mechanism will occur continuously throughout the plasma. The electron will be found in a band similar to the conduction band in solids i.e pre-ionization will take place

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S/033/60/037/005/003/024
E032/E514

Ionization and Excitation of Hydrogen. I. Elementary Processes for the Upper Levels

The ionization continuum will be lowered to the level with the principal quantum number m_o determined from the condition

$$E_{m_o} = U(r_o/2)$$

or

$$\frac{\chi_o}{m^2} = \frac{3e^2}{r_o} \qquad \left(\frac{\chi_o}{e^2} = 0.946 \cdot 10^8 \text{ cm}^{-1}\right) \qquad (2)$$

When $E_m < U(r_o/2)$ charge transfer can also take place as a result of the tunnel effect. All these phenomena are estimated quantitatively and an expression is derived for the total number of charge transfers per unit volume per second. The appropriate expression for this number is given by Eq.(7). This expression gives the total charge transfer cross-section for an excited hydrogen atom and a proton. In the second section of the paper

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S/033/60/037/005/003/024
E032/E514

Ionization and Excitation of Hydrogen. I. Elementary Processes for the Upper Levels

a calculation is made of the total effective cross-section for the various elementary processes in hydrogen plasma. Expressions are derived for the excitation (Eq.15) and de-excitation by electron collision (Eq.18) cross-sections. Contributions due to ionization by electron collision (Eq.26), photo-ionization (Eq.44), photo-recombination to all levels (Eq.33) and recombination by three-body collisions are estimated. The relative role of these effects is discussed for the ground and upper levels. There are 3 figures, 1 table and 21 references: 11 Soviet, 2 German and 8 English.

ASSOCIATIONS: Institut prikladnoy geofiziki AN SSSR
(Institute of Applied Geophysics AS USSR)
Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR
(Institute of Terrestrial Magnetism, Ionosphere and the Propagation of Radio Waves AS USSR)

SUBMITTED: April 1, 1960

Card 4/4

307/20-120-1-15/69

Ultraviolet Radiation and Excitation of Oxygen Lines in the Chromosphere

was the first to investigate this mechanism. The author studies the effect of this mechanism under conditions of the solar atmosphere. For this purpose the system of the equations of microscopic steadiness is solved separately for the triplets and quintets of OI, and the occupation of the initial levels for $\lambda\lambda$ 8446 and 7774 is determined by taking into account the L_β-decay. The author investigated, however, only four of these levels. If the freely bound processes are neglected,

the following holds: $\left(\frac{n_2}{n_1}\right)_{8446} = \frac{A_{41}}{A_{32}A_{41}}$ [illegible],

$\left(\frac{n_3}{n_1}\right)_{7774} = \frac{1}{B_{34}\varrho_{34}} b_{12}$, where n_1 denotes the degree of occupation of the ground level ^3P; A, B Einstein's coefficients; b the coefficients of excitation by an electron impact, ϱ the density of the exciting radiation. The radiation of the chromosphere in L_β may be represented here by the radiation of a black body with $T \sim 5000^\circ$. In the usual notation it holds:

$B_{14}\varrho_{L\beta} \sim A_{41} \cdot 10^{-5040\,\lambda_{14}/T}$, $b_{1[illegible]} \sim N_e \bar{\sigma} (8kT_e/\pi m)^{1/2}\, 10^{-(5040)\lambda_{13}/T_e}$,

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$B_{14}\varrho_{L\beta}/b_{15} \sim 10^3$. The estimation strongly depends on the assumed intensity of Lβ radiation and on the electron temperature T_e of the chromosphere. When λ8446 is not excited by Lβ radiation, the intensity of the chromosphere lines is bound to be low. In the absorption lines λ8446 and 7774, I_{8556}/I_{7774} is almost equal to unity. The characteristic features of the excitation of the chromosphere lines λ8446 permit the measurement of the intensity of Lβ in various regions of the chromosphere. This method obviously has advantages over the measurement of Lβ with rockets, however, it supplies only information about the density of Lβ radiation in those chromosphere layers where the emission line λ8446 is formed. In such observation it is recommendable to record λλ8446 and 7774 simultaneously. The condition $I_{8446}/I_{7774} > 1$ directly indicates the additional excitation of λ8446 by Lβ radiation. There are 1 figure and 6 references, 2 of which are Soviet.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya

Ultraviolet Radiation and Excitation of Oxygen Lines in the Chromosphere

SOV/20-130-1-13/69

radiovoln Akademii nauk SSSR (Institute of Terrestrial Magnetism, Ionosphere, and the Propagation of Radio Waves of the Academy of Sciences of the USSR)

PRESENTED: August 25, 1959, by V.O. Fesenkov, Academician

SUBMITTED: August 20, 1959

Card 4/4

NIKOLSKIY, G. M. and IVANOV-KHOLODNYY, G. S.

"On the ionization and excitation in the region between chromosphere a - corona."

report to be submitted for the IAU Symposium on the Corona, Cloudcroft, New Mexico, 28-30 Aug 1961.

NIKOLSKIY, G. M. and MOGILEVSKIY, E. I.

"On the polarization of coronal emission lines."

report to be submitted for the IAU Symposium on the Corona, Cloudcroft, New Mexico, 28-30 Aug 1961.

NIKOL'SKIY, G.M.

Photoelectric observations of zodiacal light near Alma-Ata.
Geomag. i aer. 1 no.3:354-358 My-Je '61. (MIRA 14:9)

1. Astrofizicheskiy institut AN KazSSR i Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.
(Zodiacal light)

89321

S/033/61/038/001/004/019
E032/E314

3.1540 (1062, 1128, 1184)

AUTHORS: Ivanov-Kholodnyy, G.S. and Nikol'skiy, G.M.

TITLE: Ultraviolet Solar Radiation and the Transition Layer Between the Chromosphere and the Corona

PERIODICAL: Astronomicheskiy zhurnal, 1961, Vol. 38, No. 1, pp. 45 - 65

TEXT: Preliminary results of the work now reported were described by the author in Vestnik AN SSSR, 1960, No. 10, p. 104. The physical properties of the solar chromosphere and corona are now relatively well known. It has been reported (Petri - Ref. 1) that the emission maximum in the inner corona occurs at a height of only $1.03\ R_\odot = 2 \times 10^{-9}$ cm . Thus the intermediate layer between the corona and the lower chromosphere, in which the temperature changes from about 6 000 deg to about 10^6 deg, the concentration of atoms from 10^{16} to 3×10^8 cm^{-3} and the degree of ionisation from 10^{-4} to 10^7 is a relatively

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Ultraviolet Solar Radiation and the Transition Layer Between the Chromosphere and the Corona

narrow region and physical parameters change very rapidly within it. The present paper is concerned with the upper part of the intermediate region, which is also called the "upper chromosphere" or the "sub-corona". This part of the solar atmosphere emits a strong line spectrum in the ultraviolet region which is largely responsible for the state of ionisation in the upper layers of the Earth's atmosphere. It is shown that the line intensities calculated by Woolley and Allen (Ref. 8) are always lower than the observed intensities, particularly for low ionisation potentials. It is said that the Woolley--Allen model is not satisfactory because it does not reproduce even the relative intensity of the lines. Emission lines originating in the solar corona are also found in the region under investigation (100 to 2 000 Å). The wavelength and the intensities of some of the coronal ultraviolet lines were predicted by Shklovskiy (Refs. 10, 11) as far back as 1945. Shklovskiy

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has predicted the intensity of the resonance doublets of Ne VIII (768 and 776 Å) and Mg X (610 and 625 Å). His results are said to be in conflict both with the data of Allen and Woolley (Ref. 12) and with observations. Other theoretical work in this field (Elwert, Refs. 13, 14) has also led to results which are said to be in disagreement with observations. The present authors have therefore attempted to set up a new model of the intermediate region using recently published data on the shortwave emission spectrum (Johnson et al - Refs. 2, 3, Jursa et al - Ref. 4, Behring et al - Ref. 5, Aboud et al - Ref. 6 and Violett and Rense - Ref. 7). Analysis of experimental data carried out by the present authors has led them to the following two basic formulae:

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Ultraviolet Solar Radiation and the Transition Layer Between the Chromosphere and the Corona

$$\Delta\varphi_i = \{n_e^2 T^{-1/2}[k_0 - k_1]\}_i = \frac{2.8\cdot 10^{12} f\lambda}{\varkappa_i \omega \left[\frac{a^{(i)}}{\sum a^{(i)} W'}\right]_{T=T_0}} \text{ cm}^{-3} \text{ sec}^{-1/2}. \quad (18)$$

(18)

$$\Delta T = 0.5 T_0 \quad (19) .$$

In these formulae $\varkappa$ gives the ratio of the abundance of the given element i to that of hydrogen, $n^{(i)}/\sum n^{(i)}$ is its proportion in the given stage of ionisation, I is the intensity in erg/cm^2 at the Earth surface, λ is in Å, f_{12} is the oscillator strength for absorption.

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Ultraviolet Solar Radiation and the Transition Layer Between the Chromosphere and the Corona

$W' = WT^{3/2}/f_{12}$ and T_o corresponds to the maximum of the expression $\left[n^{(i)}/\Sigma n^{(i)}\right]W$. T_o is close to the average temperature of the given radiating region and ΔT represents the difference between the boundary temperatures. Fig. 5 shows the relation between ΔT determined for a number of ions as a function of T_o. The points are experimental and the straight lines corresponds to

$$\Delta T = 0.5T_o .$$

Fig. 6 shows the relation between the "partial emission" $\Delta\varphi_i$ and the temperature T_o for different ions in the transition region. As can be seen, there is a satisfactory correlation between the points, except for N IV and N V .

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Ultraviolet Solar Radiation and the Transition Layer Between the Chromosphere and the Corona

It is shown that although the optical thickness in a number of these lines is greater than unity, self-absorption is absent. Estimates carried out by the present authors show that the nitrogen concentration on the Sun is $[N]/[H] \sim 10^{-5}$, which is lower by a factor of 1.5 than the usually accepted figure. The continuous emission of the Sun in the region 30 - 1500 A is computed. It is concluded that the X-rays recorded in rocket experiments form a line spectrum (Kazachevskaya and Ivanov-Kholodnyy, Ref. 27). 90% of the ultraviolet emission during 1958-1959 was emitted by active regions occupying 1/10 of the surface of the Sun. The surface brightness of the undisturbed regions is lower by two orders of magnitude than the brightness of the active regions. It is claimed that the model of the transition layer set up in the present paper for active and undisturbed

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regions is in agreement with optical, radio and rocket observations. The model leads to a steeper temperature variation with altitude as compared with existing models.
Acknowledgments are made to I.S. Shklovskiy for valuable advice.
There are 9 figures, 6 tables and 42 references:
11 Soviet and 31 non-Soviet.

ASSOCIATIONS: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, Ionosphere and Propagation of Radio Waves of the AS USSR)
Institut prikladnoy geofiziki AN SSSR (Institute of Applied Geophysics of the AS USSR)

SUBMITTED: September 23, 1960

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89321

S/033/61/038/001/004/019
E032/E314

Ultraviolet Solar Radiation and the Transition Layer Between the Chromosphere and the Corona

Fig. 5:

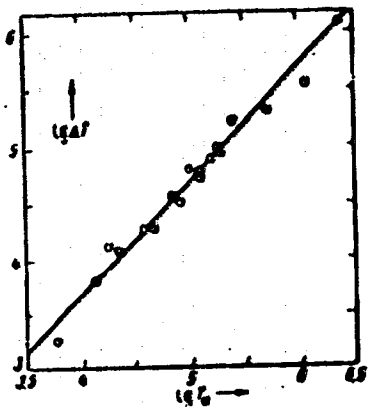
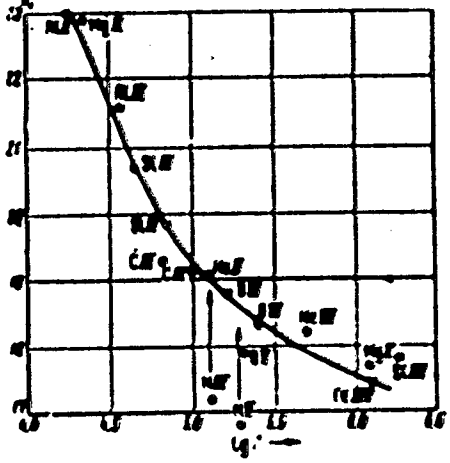


Fig. 6:



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IVANOV-KHOLODNYY, G.S.; NIKOL'SKIY, G.M.

Ionization and excitation of hydrogen. Part 2: The number of observed lines in a series. Astron.zhur. 38 no.3:455-462 My-Je '61. (MIRA 14:6)

1. Institut prikladnoy geofiziki AN SSSR i Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.
(Hydrogen—Spectra) (Hydrogen-ion concentration)

3,1540 (1164)

30814
S/033/61/038/005/002/015
E133/E435

AUTHORS: Ivanov-Kholodnyy, G.S., Nikol'skiy, G.M.

TITLE: The prediction of solar emission lines in the extreme ultraviolet

PERIODICAL: Astronomicheskiy zhurnal, v.38, no.5, 1961, 828-843

TEXT: Although many spectra have been obtained in the extreme ultraviolet in recent years, line identification is often doubtful, particularly for $\lambda < 300$ Å. Previous theoretical work of the authors (Ref.1: Astron. zh., 38, 45, 1961) on the intensity of lines in this region of wavelength does not agree with observation. The present work gives a full list of the estimated brightest resolved lines in the far ultraviolet. The maximum temperature was assumed to be 3×10^6 °K. The methods of calculation used were developed in the earlier paper (Ref.1). A parameter $\Delta\varphi_i$ is employed which depends on the ionization temperature T_i. The relationship between $\Delta\varphi_i$ and T_i was determined from observations of the intensities of 27 sufficiently bright lines lying near $\lambda \sim 1200$ Å (Table 1). Most of the ions chosen have hydrogen-like configurations and have been

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observed several times in rocket spectra. The absorption intensity is given in column 3 of the table ($I(L\alpha)$ - erg/cm^2/sec). It must be remembered that there appears to be a variation of intensity with solar cycle. The authors calculate T_1 for 50 ions, by the method described in Ref.1 and hence derive f_{ij}. The ratio $I/\pi f$ can now be expressed as a function of λ and T_1. Nomograms are constructed in order to simplify the calculations. The transitions and wavelengths are listed in a long table. These were calculated on the basis of the tables of Ch.E.Moore (Ref.10: Atomic Energy Levels, Washington, v.1, 1949, v.2, 1952). Where terms are omitted in this work, they were obtained by extrapolation along isoelectronic sequences. (Where this has been done, the lines are shown in brackets in the table. Lines belonging to a single multiplet are bracketed together.) This table consists basically of transitions for which the Laporte rules hold. The most complicated problem in the calculations is the determination of the probability of excitation by electron collision. In many cases, the oscillator strength can only be estimated. Values of log T_1 greater than 1.6×10^6 are shown (in brackets), since this is believed to be the maximum

Card 2/4

The prediction of solar ...

temperature of the inner corona. Correspondingly, inequality signs are put in the intensity column. The relative composition of the Sun is taken from the work of C.W.Allen (Ref.3: Astrophys. Quantities, 1955, London Athlone Press). The amount of nitrogen present is taken to be 10^{-5}. Future articles will compare these predictions with observations. There are 3 figures, 2 tables and 11 references: 3 Soviet-bloc and 8 non-Soviet-bloc. The four most recent references to English language publications read as follows:

Ref.5: A.Aboud, W.E.Behring, W.A.Rense, Astrophys. J., v.130, 381, 1959;
Ref.6: H.E.Hinteregger, "Preliminary data on solar extreme ultraviolet radiation in the upper atmospheres" (preprint), Symposium, Florenz, 1961;
Ref.8: T.Violett, W.A.Rense, Astrophys. J., v.130, 954, 1959.
Ref.9: J.D.Purcell, D.M.Packer, R.Tousey, The Ultraviolet Spectrum of the Sun, Sumposium Nice, February 11-16, 1960.

ASSOCIATION: Institut prikladnoy geofiziki AN SSSR, Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Applied

Card 3/[illegible]

3084
S/033/61/038/005/002/015
E133/E435

The prediction of solar ...

Geophysics, AS USSR. Institute of Terrestrial Magnetism, the Ionosphere and Propagation of Radiowaves AS USSR)

SUBMITTED: May 16, 1961

4

Card 4/4

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

AUTHOR: Nikol'skiy, G.M.

TITLE: Short-wave radiation of the sun (Review)

PERIODICAL: Geomagnetizm i Aeronomiya, v.2, no.1, 1962, 3-37

TEXT: The article reviews Western and Soviet literature covering the period up to 1961. The topics treated are: experimental data on short-wave radiation of the sun and the identification of spectral lines; short- wave radiation intensity of the sun and the ionosphere of the earth; short-wave radiation and the structure of the sun's atmosphere. There are 20 figures, 7 tables and 85 references.

Card 1/1

43155
S/203/62/002/003/003/021
I025/I250

AUTHOR: Ivanov-Kholodnyy, G.S. and Nikol'skiy, G.M.

TITLE: Identification of Sun's radiation lines in the short-wave region of the spectrum ($\lambda \leq$ 1100A)

PERIODICAL: Geomagnetism i Aeronomiya, v.2, no.3, 1962, 425-442

TEXT: Out of $\sim$225 lines of Sun's shortwave radiation (60 to 1100Å) obtained by means of rockets, 180 lines are identified in this work. The intensity of the lines is taken into account. A critical analysis of former identifications is given. In the spectral energy distribution maxima in the following wavelength regions were found: 60-100 (corona), 200-450, 550-650, 750-850, 950-1050A. A minimum estimate of the total energy of the line radiation ($\lambda \leq$ 1100Å) is 15 erg/cm^2 sec at the Earth. Half of this energy is concentrated in the region of 200-400 Å. The relative content of nitrogen on the Sun is N/H = 3x10^{-5}. The identification of the lines was done by comparison with a list of 540 spectral lines, in the range 18-1100Å, taken from a work by the same authors: Astron.Zh.1961, 38, 828. The

Card 1/2

S/203/62/002/003/003/021
I023/1250

Identification of Sun's radiation...

Intensities of the lines in this list exceed $3 \times 10^{-4} - 10^{-3}$ erg/cm^2 sec. There is 1 table, 4 figures, 19 references.

ASSOCIATION: Institut prikladnoy geofiziki Akademii nauk SSSR, Institut Zemnogo magnetizma, ionosfery i rasprostraneniya radiovolu Akademii nauk SSSR (Institute of Applied Geophysics, Academy of Sciences of the USSR; Institute of Terrestrial Magnetism, Ionosphere and Radiowave Propagation, Academy of Sciences of the USSR)

SUBMITTED: September 2, 1961

Card 2/2

S/203/62/002/003/016/021
I023/I280

3.1520

AUTHOR: Nikol'skiy, G.M., Proshin, V.P. and Sazanov, A.A.

TITLE: A shadowless coronograph with a stationary spectrograph of high dispersion

PERIODICAL: Geomagnetism i Aeronomiya, v.2, no.3, 1962, 532-540

TEXT: The coronograph described was constructed in the IZMIRAN. Its aim is to obtain spectra of the corona and of the chromosphere with a dispersion of 1.5A/mm in the range of wave lengths 3600 - 12000 A. The coronograph consists of a mobile part ensuring a precise direction and focus of the objective and transmitting the rays into the stationary part - the spectrograph. The one-lens objective 250 mm/4000 mm) produces the Sun's image on a curved slit which can turn around the optical axis of the objective by 360°. A system of mirrors finally produces the image of the objective in the plane of a diffraction grid (600 lines/mm, area of 150x150 mm²). The spectrum obtained may be photographed directly or deflected by an auxiliary plane mirror to an electronic recording system. The corono-

Card 1/2

NIKOL'SKIY, G.M.

Solar radiation in resonance lines HeII 304Å and HeI 584Å.
Geomag.i aer. 2 no.6:1025-1032 N-D '62. (MIRA 16:1)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.
(Solar radiation)

S/020/62/147/004/009/027
B117/B186

AUTHOR: Nikol'skiy, G. M.

TITLE: 304 Å HeII and 584 Å HeI resonant lines in the sun

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 147, no. 4, 1962, 809-812

TEXT: The intensity of 304 Å and 584 Å solar radiation was studied, its distribution over the solar disk and the formation height of these lines in the solar atmosphere being based on results of earlier rocket probes (G. S. Ivanov-Kholodnyy, G. M. Nikol'skiy, Geomagn. i aeronomiya, 2, no. 3 (1962); R. A. Gulyayev, K. I. Nikol'skaya, G. M. Nikol'skiy, Astr. zhurn., 40 (1963) in the press). It was shown that practically all He atoms in the sun exist in their ground state. Essential processes are electron collisions acting on the ground level, and recombinations. These processes excite the 2^2p^o initial level which is left by atoms in spontaneous processes. It was found that 304 Å radiation in the bottom layers of the solar atmosphere is "optically thick" although negligible owing to low temperatures ($T_e \approx 10^{5o}K$). The width of these lines, calculated by the Doppler effect, is 0.04 Å . 7/10 of the 304 Å radiation is emitted by the

Card 1/3

304 Å HeII and 584 Å HeI...

active regions of the sun. The emission of active regions is six times that of nonexcited regions. 304 Å emission of the sun is 0.9 erg/cm^2·sec. 584 Å and 304 Å radiations are "optically thick" and also negligible. They are generated in an optically thin layer in the Te ≈6300°K region. 80% of this radiation is excited by recombination. The emission of active regions is 3.5 that of nonexcited regions. The 584 Å emission of the sun near the earth is ~0.05 erg/cm^2·sec. Approximately half the radiation is attributed to the active regions of the sun. Intensification of the spectral lines observed during outbursts (W. E. Behring, W. M. Neupert, J. C. Lindsay, Preliminary Solar Flare Observation with a Soft X-Ray Spectrometer on the Orbiting Solar Observatory, Preprint by Solar Phys. Branch Space Sci. div. COSPAR III, 1962), is interpreted by the author as implying that outbursts in the chromosphere should not be considered as explosions, but a permanent source of energy emission. There are 2 figures.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i resprostraneniya radiovoln Akademii nauk SSSR (Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation of the Academy of Sciences USSR)

Card 2/3

304 Å HeII and 584 Å HeI...

S/020/62/147/004/009/027
B117/B186

PRESENTED: July 4, 1962, by V. G. Fesenkov, Academician

SUBMITTED: June 28, 1962

Card 3/3

Nikolskiy
~~NIKOLSKI~~, G.M.

Star coronas and their study in the field of X-rays and extreme ultra-violet. (USSR)

Report submitted for the 4th International Space Symposium (COSPAR) Warsaw, 2-12 June 63

NIKOL'SKIY, G.M.

2

KONDRAT'YEV, Kirill Y., GAYEVSKAYA, G. N., NIKOL'SKIY, G. M.

"Balloon investigations of tropospheric and stratospheric radiative regime"

Report to be submitted for the 13th General Assembly, Intl. Union of Geodesy and Geophysics (IUGG), Berkeley Calif., 19-31 Aug 63

LIVSHITS, M. A.; NIKOL'SKIY, G. M.

"Izvestiia Astrofizicheskogo Instituta AN Kaz.SSR." (On M. G. Karimov's work). Astron. zhur. 40 no.1:199-201 J-F '63. (MIRA 16:1)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

(Sun—Corona)

L 11144-63 EPF(c)/EWT(l)/EWT(m)/FCC(w)/BDS/ES(v)/EEC-2 AFFTC/ESD-3
Pr-4/Pe-4/Pq-4 WW/GW
ACCESSION NR: AP3001237 S/0033/63/040/003/0433/0445

AUTHOR: Gulyayev, R. A.; Nikol'skaya, K. I.; Nikol'skiy, G. M.

TITLE: Structure of the solar atmosphere in active and unperturbed regions. Hydrogen and helium ionization

SOURCE: Astronomicheskiy zhurnal, v. 40, no. 3, 1963, 433-445

TOPIC TAGS: solar atmosphere, solar chromosphere, Balmer continuum, solar short-wave radiation, solar temperature, solar electron concentration, neutral hydrogen, ionized hydrogen, solar helium, ionized helium

ABSTRACT: This paper analyzes observations of the active and unperturbed regions of the solar atmosphere. The distribution of the temperature T, neutral hydrogen n-sub-HI, and electron concentration n-sub-e in the lower chromosphere at h equal to or greater than 1,000 km was obtained from eclipse observations in the Sr II lines and in the Balmer continuum (Thomas, R. N., Athay, R. G., Physics of the solar chromosphere, Interscience Publ., N.Y., 1961), see Figs. 1 and 2. The data obtained are in good agreement with the model set forth by G. S. Ivanov-Kholodnyy and G. M. Nikol'skiy (Astron. zh., v. 39, 1962, 777) for the transition region and the corona at h from 5,000 to 7,000 km. Various mechanisms of the ionization of h

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L 11144-63

ACCESSION NR: AP3001237

and H are postulated and examined. The distribution of HI, HeI, HeII, and HeIII is found for elevations from 1,000 km up to the inner corona (Figures 4a and 4b). Short-wave solar radiation participates effectively in the ionization of H and He the chromosphere and the transition region. The theoretical calculation of the continuous He emission at wavelengths equal to or smaller than 504 and 220 angstro are in good agreement with rocket observations (Hinteregger, H. E., J. Geophys. Res., v. 66, no. 8, 1961, 2367; Astrophys. J., v. 132, 1960, 801). There are 4 figures and 5 tables.

ASSOCIATION: In-t Zemnogo magnetizma, ionosfery*i rasprostraneniya radiovoln, Akademii nauk SSSR (Institute of Earth Magnetism, the Ionosphere, and Radiowave Propagation, Academy of Sciences, SSSR)

SUBMITTED: 21May62 DATE ACQD: 01Jul63 ENCL: 03

SUB CODE: AS, PH NO REF SOV: 006 OTHER: 017

Card 2/2

NIKOL'SKIY, G.M.

Structure of and shortwave radiation from the upper atmospheres of stars. Part 1. Continuous emission of hydrogen and helium. Astron.zhur. 40 no.4:668-677 Jl-Ag '63. (MIRA 16:8)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.
(Stars--Atmospheres) (Cosmic rays)

NIKOL'SKIY, G.M.

Energy of short-wave solar radiation in the spectral region $\lambda <$ 1100 Å. Geomag. i aer. 3 no.5:793-802 S-O '63. (MIRA 16:11)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

ACCESSION NR: AP4017615 S/0033/64/041/001/0075/0079

AUTHOR: Livshits, M. A.; Nikol'skiy, G. M.

TITLE: The n_e and T relation in the chromosphere - corona transition region

SOURCE: Astronomicheskiy zhurnal, v. 41, no. 1, 1964, 75-79

TOPIC TAGS: atmosphere, chromosphere, corona, spectroscopy, stellar atmospheres, transition region, stellar radiation

ABSTRACT: The authors discuss the formation of t[illegible] transition region between the chromosphere and the corona, pointing out that the [illegible]nergy ablated by radiation from any level of the transition level is composed of the dissipation energy of the shock waves at that level and the energy carried upward a[illegible] a result of heat conduction. The authors call "important" the conclusion accordi[illegible] g to which, in the transition region, both in undisturbed as well as active regions, the law $n_e T^{2.5} = \text{const}$. has been found to be valid. It is affirmed that in a stable condition the energy balance in the transition region of stellar atmospheres is described by the equation:

$$\mathcal{E}(n_e, T) = E_{diss.}(n_e, T);$$

that is, by the equality of two independent functions: the emission and energy of

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ACCESSION NR: AP4017615

dissipation per cm^3. In this article, the authors attempt to determine the universality of the found dependence of $\mathcal{E}$ on density and temperature, noting that, since the emission of the transition region in all stellar atmospheres (having in mind "stable" stars) is caused by the radiation of an optically thin layer in shortwave lines (with this radiation belonging to different ions formed and excited by electron collisions), then $\mathcal{E}$ in the function n_e and T can be found theoretically. Thus, the law $n_e^{2.5}T = const.$, found for the solar transition region, is generalized to apply to the atmospheres of "stable" stars. It is assumed, in this connection, that the cooling source of the transition region is line emission by highly ionized atoms; this cooling is compensated by the dissipation energy of weak shock waves. From this, according to the authors, it follows that, in the first approximation, this law holds for the transition regions of "stable" stars. Some peculiarities of the transition region are discussed, it being demonstrated that in the chromosphere and corona density distribution corresponds to the hydrostatic (in the chromosphere the logarithmic gradient is not more than two times less than the observed, while in the corona they are identical when $T \approx 1.5 \cdot 10^6$). Orig. art. has: 3 figures and 8 formulas.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln Akademii Nauk SSSR (Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation of the Academy of Sciences, SSSR)

Card 2/3

NIKOL'SKIY, G.M.

Structure and microwave emission of stellar upper atmospheres.
Part 2: Distribution of electron density and temperature.
Astron.zhur. 41 no.2:251-254 Mr-Ap '64. (MIRA 17:4)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

L 6631-65 EWG-4/EWG(v)/EWT(1) Pe-5/Pq-4 GW

ACCESSION NR: AP4031823 UR/0203/64/004/002/0209/0212
523.77

AUTHOR: Nikol'skiy, G.M.

TITLE: The observation of oxygen multiplets Lambda 7774 and Lambda 8446 in the solar chromosphere

SOURCE: Geomagnetism i aeronomiya, v. 4, no. 2, 1964, 209-212

TOPIC TAGS: solar chromosphere, solar spectrography, solar spectrum, oxygen line

ABSTRACT: Earlier theoretical discussions showed that the oxygen multiplets λ7774 and λ8446 could be excited either by electron impact or, in the case of λ 8446, by the chromospheric HI Lβ 10025.73 Å line. I.S. Shklovskiy tried without success (Astron. zh., 1957, 34, 127) to observe the λ 8446 line in the Earth's atmosphere (during twilight). In the solar atmosphere these lines were observed by two researchers

by means of an interocular coronograph.

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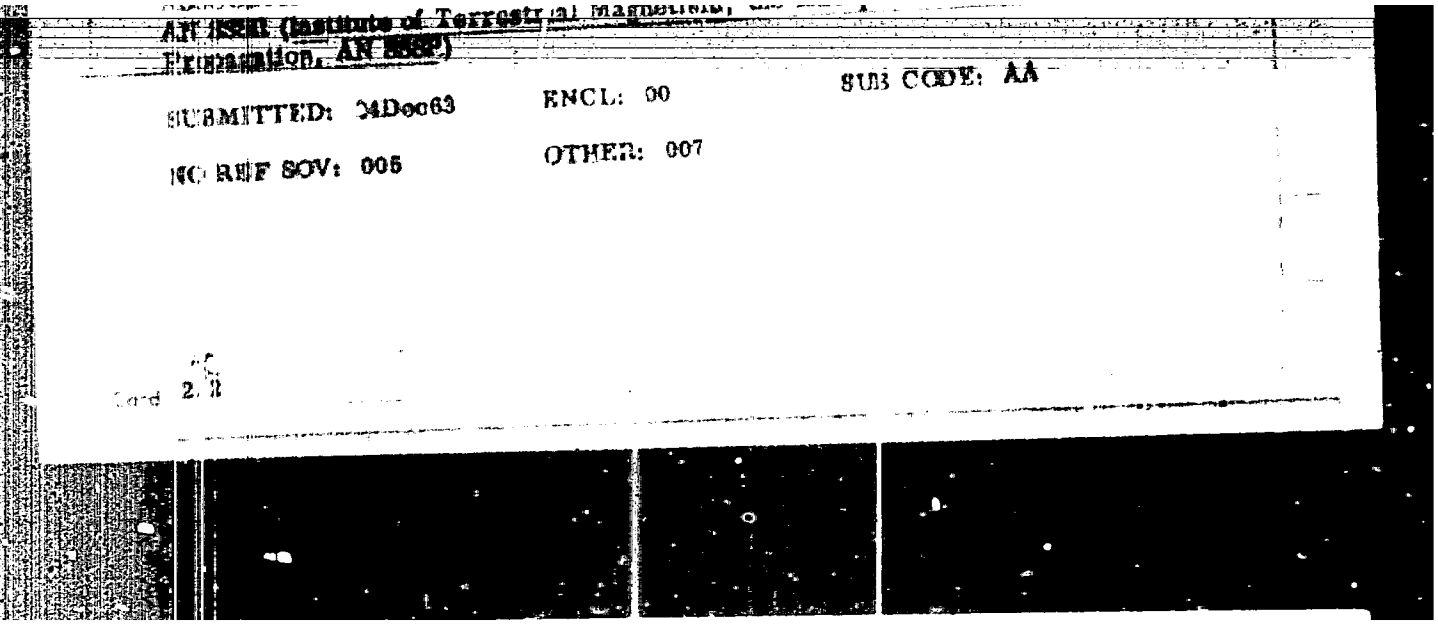
ACCESSION NR: AP4021023

λ 7774 multiplet consists of three components, while λ 8446 has only two observable components. The observed intensity ratios are respectively 7:6:4 (theory: 1;5;3) and 5:3.6 (5:4, or 5:3:1 for the theoretically expected triplet). The width of the multiplets and other effects in conjunctions with the observed lines, including the [illegible] atmospheric absorption, are also discussed in consider-

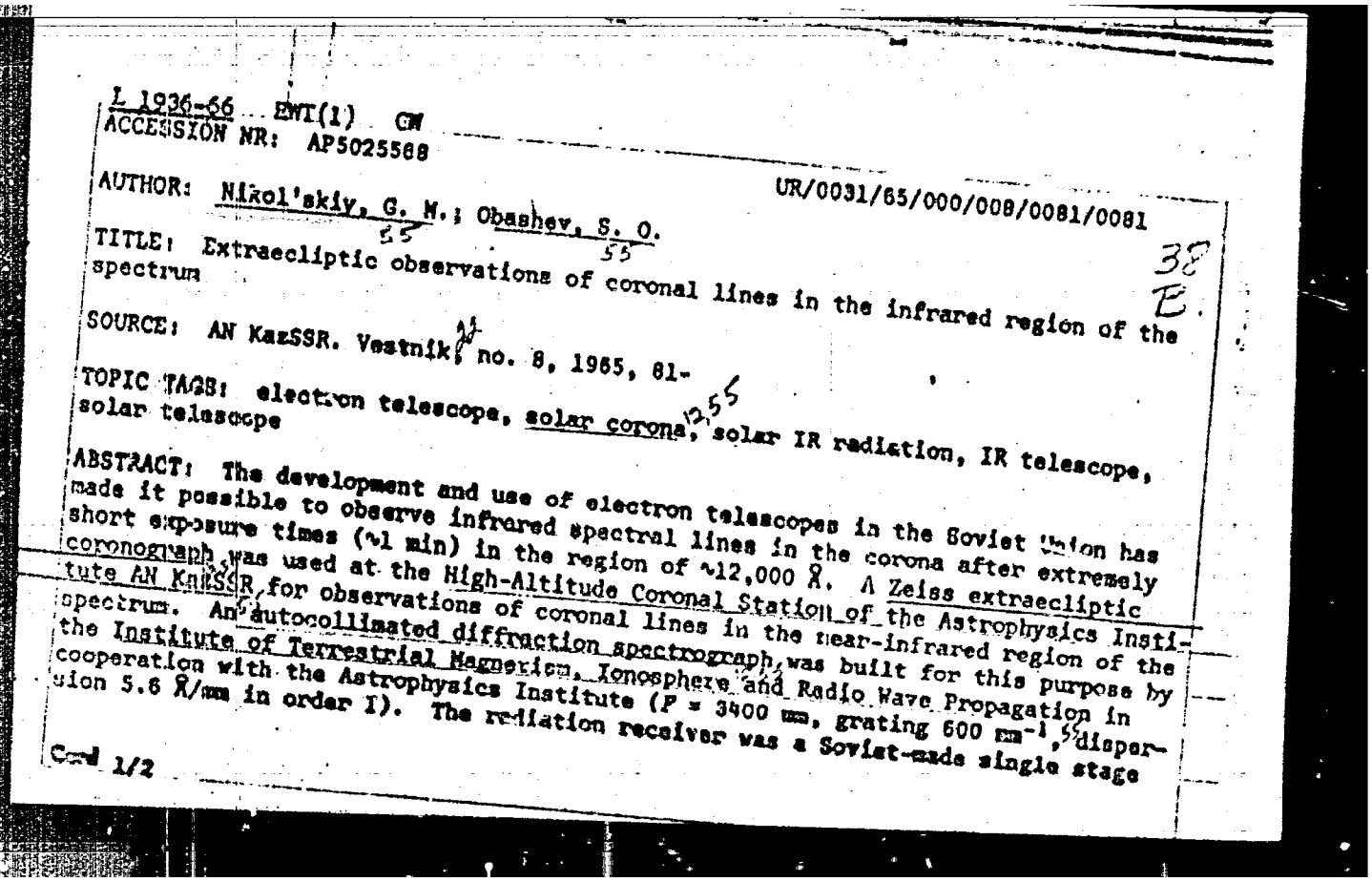


AN USSR (Institute of Terrestrial Magnetism, ...
Ionosphere and Radio Wave Propagation, AN ...)

SUBMITTED: 24Dec63 ENCL: 00 SUB CODE: AA

NO REF SOV: 005 OTHER: 007

Card 2/2



L 1936-66 EWT(1) GW
ACCESSION NR: AP5025568 UR/0031/65/000/008/0081/0081

AUTHOR: Nikol'skiy, G. M.; Obashev, S. O. 55 55

TITLE: Extraecliptic observations of coronal lines in the infrared region of the spectrum 38 E

SOURCE: AN KazSSR. Vestnik, no. 8, 1965, 81-

TOPIC TAGS: electron telescope, solar corona, solar IR radiation, IR telescope, solar telescope

ABSTRACT: The development and use of electron telescopes in the Soviet Union has made it possible to observe infrared spectral lines in the corona after extremely short exposure times (~1 min) in the region of ~12,000 Å. A Zeiss extraecliptic coronograph was used at the High-Altitude Coronal Station of the Astrophysics Institute AN KazSSR for observations of coronal lines in the near-infrared region of the spectrum. An autocollimated diffraction spectrograph was built for this purpose by the Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation in cooperation with the Astrophysics Institute (F = 3400 mm, grating 600 mm-1, dispersion 5.6 Å/mm in order I). The radiation receiver was a Soviet-made single stage

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L 1936-66
ACCESSION NR: AP5025568

electron optical converter with an oxygen-cesium photocathode cooled by dry ice. 85 mm/1.5 "Helios-40" lenses were used for the transfer optical system. A number of spectrograms in the Fe XI λ 7892 and Fe XIII λ 10747 regions were taken between 17 February and 10 March 1965. Examples of these spectrograms are shown in the article. In spite of the low chlorosphere-photosphere activity and poor atmospheric conditions during this period, it was possible in many cases to record the λ 7892 line. Both these lines were observed during the complete absence of the Fe X λ 6374 line in the solar corona. Orig. art. has: 2 figures.

ASSOCIATION: none

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

NO REF SOV: 000 OTHER: 000

Card 2/2

L 36609-66 EWT(1)/FCC GW

ACC NR: AT6023722 SOURCE CODE: UR/2831/65/000/014/0005/0008

52
B

AUTHOR: Ivanov-Kholodnyy, G. S.; Nikol'skiy, G. M.

ORG: none

TITLE: Short-wave solar radiation, structure of the solar atmosphere and the ionosphere

SOURCE: AN SSSR. Mezhduvedomstvennyy geofizicheskiy komitet. V razdel programmy MGG: Ionosfera. Sbornik statey, no. 14, 1965. Ionosfernyye issledovaniya, 5-8

TOPIC TAGS: solar spectrum, F layer, solar corona, chromosphere, solar UV radiation, solar cycle, atmospheric ionization, ionosphere, solar activity, solar atmosphere

ABSTRACT: An examination has been made of 225 spectral lines obtained from various spectrograms in the short ultraviolet range to identify them with known lines. Such identification requires the knowledge of physical conditions in the solar corona and the intermediate space between the corona and the chromosphere. A theory of ionization in the solar atmosphere was developed, and, on the basis of this theory, lines were computed which must appear in the solar ultraviolet range. From spectrograms 180 lines were identified with lines computed theoretically. Fe, Si, and hydrogen lines were the brightest. A model of active regions on the sun was composed

Card 1/2

L 36609-66

ACC NR: AT6023722

O

to explain geophysical phenomena. The brightness of the active regions in ultraviolet light was found to be 30 times that of the quiet areas. The intensity of ultraviolet radiation varies from day to day and depends upon the phase of the solar activity cycle. The total flux of solar ionizing radiation was determined, and during maximum solar activity, it was equal to 15 erg/cm^2 · sec. New data on the short-wave spectrum (0—1100 A) were used for computing the speed of ionization in the atmosphere. A model of the ionosphere for the heights of 100—800 km was developed for various moments in the day. The maximum ion formation occurs in the F1 layer during the day and in the F2 layer at night. Variations of ion formation are great in the F1 layer and small in the F2 layer. The asymmetry in the density of the upper atmosphere at noon causes an asymmetry in changes of the speed of ion formation and the number of electrons. This phenomenon contradicts Appleton's method for determining the recombination coefficient. New data require a change in earlier concepts of the processes of ionization and recombination in the ionosphere. Orig. art. has: 1 figure. [EG]

SUB CODE: 03/ SUBM DATE: none/ ORIG REF: 009/ OTH REF: 001/ ATD PRESS: 5036

Card 2/2

L 10835-67 EWT(1) GW

ACC NR: AR6034628 SOURCE CODE: UR/0313/66/000/008/0038/0038 38

AUTHOR: Ivanov-Kholodnyy, G. S.; Nikol'skiy, G. M.

TITLE: Short-wave solar radiation and structure of the solar atmosphere and ionosphere

SOURCE: Ref. zh. Issledovaniye kosmicheskogo prostranstva, Abs. 8.62.260

REF SOURCE: Sb. Ionosfern. issledovaniya. No. 14. M., Nauka, 1965, 5-8

TOPIC TAGS: solar atmosphere, spectral distribution, solar radiation, upper atmosphere, ionosphere

ABSTRACT: The problem of investigating the spectral distribution of intensity of the short-wave solar radiation is discussed. A brief survey is given of articles devoted to this problem. The results are presented for determining the rates of ion formation in the upper atmosphere at different times of day. Bibliography of 10 titles. [Translation of abstract]

SUB CODE: 03/

Card 1/1 bjw

L 02999-67 EWT(1) GW

ACC NR: AP6033162 SOURCE CODE: UR/0033/66/043/005/0928/0935

19
B

AUTHOR: Nikol'skiy, G. M.; Sazanov, A. A.

ORG: Institute of Terrestrial Magnetism, the Ionosphere and Radio Wave Propagation, Academy of Sciences, SSSR (Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln Akademii nauk SSSR)

TITLE: The motion and nature of H_α spicules in the solar chromosphere

SOURCE: Astronomicheskiy zhurnal, v. 43, no. 5, 1966, 928-935

TOPIC TAGS: solar chromosphere, chromosphere spicule, photospheric radiation, corona, radial velocity, SOLAR SPICULE

ABSTRACT: The H_α line profiles in 11 spicules and their radial velocities V_r are investigated using successive photographs of the spectra of spicules taken at a height of about 6000 km. Altogether 26 photographs of the spicules with an average interval of 20 sec were taken in 8 min with the IMIRAN (Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation) coronograph (principal objective 25/cm/4m, 2Å/mm, equivalent focus 7 m). The radial velocities are random with time with an average period of 1 min. The sign of V_r can also vary. The main mechanism of H_α emission of spicules is scattering of photospheric radiation. At the height of 6000 km the spicule is optically thin in $H\alpha$ ($\tau \lesssim 0.05$) and has the following physical parameters: $T \approx 6000°$, $n_H \gtrsim 10^{11}$ cm^{-3}, $n_e \gtrsim 10^{10}$—10^{11} cm^{-3}. The chaotic

Card 1/2 UDC: 523.75

L 02999-67
ACC NR: AP6033162

motions of separate clots of matter with velocities of 10—20 km/sec play an essential role in the formation of the H_α line profiles. About one-third of the spicules show a "doublet" structure, the doublet components having practically identical dynamic and photometric characteristics. It is possible that one-third is the lowest estimate, as the distance of ~3"—4" between the components of the observed doublets coincides with the resolving power of the instrument. Orig. art. has: 7 figures and 3 formulas.

SUB CODE: 03/ SUBM DATE: 20Nov65/ ORIG REF: 007/ OTH REF: 007/ ATD PRESS: 5099

Card 2/2 nvm

L 02445-67 EWT(1) GW

ACC NR: AP6028800 SOURCE CODE: UR/0033/66/043/004/0868/0872

26
B

AUTHOR: Nikol'skiy, G. M.; Sazonov, A. A.

ORG: Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation, Academy of Sciences, SSSR (In-t zemnogo magnetizma, ionosfery, rasprostraneniya radiovoln Akademii nauk SSSR)

TITLE: Noneclipse coronographs

SOURCE: Astronomicheskiy zhurnal, v. 43, no. 4, 1966, 868-872

TOPIC TAGS: eclipse, coronograph, spectrograph, ASTROPHYSIC INSTRUMENT, SOLAR CORONA

ABSTRACT: The simplified types of the noneclipse coronograph are critically analyzed. The necessity of constructing a large Lyot-type coronograph equipped with a stationary high dispersion spectrograph is discussed. An optical schematic diagram is given and the main characteristics are described for such an instrument, which is under construction made at the Institute of Terrestrial Magnetism and Pulkovo Observatory under the supervision of the authors. Orig. art. has: 3 figures. [08]

SUB CODE: 03/ SUBM DATE: 20Nov65/ ORIG REF: 003/ OTH REF: 002

Card 1/1 gd UDC: 522.56

ACC NR: AP7010686 SOURCE CODE: UR/0384/66/000/004/0008/0016

AUTHOR: Nikol'skiy, G. M. (Doctor of physico-mathematical sciences)

ORG: none

TITLE: Short-wave solar radiation

SOURCE: Zemlya i vselennaya, no. 4, 1966, 8-16

TOPIC TAGS: solar radiation, solar atmosphere

SUB CODE: 03

ABSTRACT: The article cited below reviews the history of study of solar short-wave radiation. It is noted that such study is now an important research tool for the astrophysicist for investigation of the physical processes in those layers of the solar atmosphere which in large part cannot be observed from the earth's surface. In the short-wave region of the spectrum the relatively cold layers of the solar atmosphere -- the photosphere and lower chromosphere -- have virtually no emission and the entire spectrum with wavelengths shorter than 1000 A is determined by the hottest layers -- the corona and upper chromosphere. Usually almost all the atoms (or ions) are in the ground state and therefore chemical quantitative analysis inevitably involves conversion to the number of atoms in the ground state.

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ACC NR: AP7010686

Since the overwhelming majority of the short-wave lines are related to the ground state of atoms (or ions) the most precise data on the chemical composition can be obtained from an analysis of short-wave data. The article makes clear the importance of such studies and gives brief data on the methods and instruments used in such studies, together with the most important results obtained by Soviet and American researchers, but on the whole is of an introductory and superficial character. Orig. art. has: 6 figures. [JPRS: 40,291]

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28(1) PHASE I BOOK EXPLOITATION SOV/2156

Soveshchaniye po kompleksnoy mekhanizatsii i avtomatizatsii tekhnologicheskikh protsessov. 2nd, 1956.

Avtomatizatsiya mashinostroitel'nykh protsessov; /trudy soveshchaniya/, tom. 1: Goryachaya obrabotka metallov (Automation of Machine-Building Processes; Proceedings of the Conference on Over-All Mechanization and Automation of Technological Process, Vol 1: Hot Metal-Forming) Moscow, 1959. 379 p. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya. Komissiya po tekhnologii mashinostroyeniya.

Resp. Ed.: V.I. Dikushin, Academician; Compiler: V.M. Rashnikov; Ed. of Publishing House: V.A. Kotov; Tech. Ed.: I.F. Kuz'min.

PURPOSE: The book is intended for mechanical engineers and metallurgists.

COVERAGE: The transactions of the Second Conference on the Over-All Mechanization and Automation of Industrial Processes, September 25-29, 1956, have been published in three volumes. This book, Vol. I, contains articles under the general title, Hot Working of Metals. The investigations described in the book were conducted by the Sections for Automation and Hot Working of Metals, under the direction of the following scientists: casting - P.N. Aksenov, D.P. Ivanov and G.A. Orlov; forming - A.I. Tselikov, A.D. Tomlenov and V.T. Meshcherin; welding - G.A. Nikolayev, B.I. Preiev and G.A. Maslov. There are 183 references: 142 Soviet, 34 English, 6 German, and 1 French.

TABLE OF CONTENTS:

PART I. AUTOMATION OF CASTING PROCESSES

PART II. AUTOMATION OF METAL FORMING UNDER PRESSURE

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Nikol'skiy, G.N.

AUTHOR: None given SOV/180-59-4-47/48

TITLE: A Conference on the Accuracy of Machine Building Castings

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 4, pp 255-256 (USSR)

ABSTRACT: A conference on the above subject took place in the Institute of Machine Building of the Academy of Sciences of the USSR on 22-25th April 1959. About 200 representatives of scientific-research institutes, laboratories, universities and largest works from 38 towns participated in the conference. The following papers were read: B.B.Gulyayev "The present state of studies of the accuracy of castings"; P.N.Aksenov "Tasks of investigations of the dependence of the accuracy of castings on technological factors"; B.I.Berg "Methods of analytical evaluation of dimensions of castings"; Yu.A.Vereshchagin "Theoretical and experimental investigations of the accuracy of castings"; I.P.[illegible] - "The system of allowances for mechanical working of castings"; Ye.G.[illegible] "Methods for the determination of tolerances for dimensions of cast parts". [illegible] "Tolerances for non-ferrous castings produced by various methods of casting"; G.N.Nikol'skiy "Methods of controlling the cleanliness of the surfaces of castings"; I.S.Konstantinov "The influence of stresses formed during casting on the accuracy of castings". I.Ye.[illegible] "The process of packing moulds as a factor determining the accuracy of castings"; [illegible] and [illegible] "Sources of errors in the dimensions of castings caused by specific features of operation of the pattern-mould boxes equipment". A.V.[illegible] "Typical deformations of casting moulds". [illegible] "Conditions of making accurate castings in sand moulds". [illegible] "The influence of the chemical composition of iron on the accuracy of dimensions of castings". [illegible] and [illegible] "Improvement in the accuracy of castings made in pressed shell moulds". [illegible] "Experience in increasing the cleanliness and accuracy of large castings". [illegible] and [illegible] "On the accuracy of castings made by the lost wax method"; [illegible] "An investigation of the accuracy and surface [illegible] of castings made under pressure and by the lost wax method". [illegible] and B.B.Gulyayev "The formation of the contours of castings during casting under pressure". [illegible], A.I.[illegible] and [illegible] "An improvement in the surface quality of castings made under pressure by forming a vacuum [illegible] the pressure moulds". It was established that studies on the subject of the accuracy of castings are developing too slowly mainly due to lack of coordination in the research work and insufficient numbers of specialists in the field of mathematics, physics and electronics. In order to develop methods for overall calculation of the accuracy, productivity and economy of casting processes the conference recommended organizing in Moscow, Leningrad and Kiyev (at scientific research institutes and universities) [illegible] of [illegible] specialists [illegible].

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NIKOLSKIY, G.N.

PHASE I BOOK EXPLOITATION SOV/5304

Soveshchaniye po teorii liteynykh protsessov. 5th, 1959

Tochnost' otlivok; trudy soveshchaniya (Accuracy of Castings; Transactions of the Fifth Conference on the Theory of Founding Processes) Moscow, Mashgiz, 1960. 306 p. 3,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya. Komissiya po tekhnologii mashinostroyeniya.

Ed. (Title page): B. B. Gulyayev, Doctor of Technical Sciences, Professor; Ed. of Publishing House: G. N. Soboleva; Tech. Ed.: S. P. Uvarova; Managing Ed. for Literature on Hot-Processed Metals: S. Ya. Golovin, Engineer.

PURPOSE: This book is intended for scientific and technical personnel at scientific research institutes, factories, and schools of higher education.

COVERAGE: The book contains 19 reports read at a conference on the accuracy of castings. The conference was organized by the Committee on Processing in Machine Building and sponsored by the Institut mashinovedeniya AN SSSR (Institute of the Science of Machines of the Academy of Sciences USSR). The reports, presented by leading specialists, science workers, and production personnel, discuss the present state of the problem of the accuracy of castings and methods of solving the problems involved. There are 58 references, mostly Soviet.

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NIKOLSKIY, G. N.

PHASE I BOOK EXPLOITATION SOV/5458

Girshovich, Naum Grigor'yevich, Doctor of Technical Sciences, Professor, ed.

Spravochnik po chugunnomu lit'yu (Handbook on Iron Castings) 2d ed., rev. and enl. Moscow, Mashgiz, 1961. 800 p. Errata slip inserted. 16,000 copies printed.

Reviewer: P. P. Berg, Doctor of Technical Sciences, Professor; Ed.: I. A. Baranov, Engineer; Ed. of Publishing House: T. L. Leykina; Tech. Eds.: O. V. Speranskaya and F. S. Frumkin; Managing Ed. for Literature on Machine-Building Technology (Leningrad Department, Mashgiz): Ye. P. Naumov, Engineer.

PURPOSE: This handbook is intended for technical personnel at cast-iron foundries. It may also be of use to skilled workmen in foundries and students specializing in founding.

COVERAGE: The handbook contains information on basic problems in the modern manufacture of iron castings. The following are discussed: the composition and properties of the metal; the making of molds; special casting methods; the charge preparation; melting

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and modifying the cast iron; pouring, shaking out, and cleaning of castings; heat-treatment methods; and the inspection and rejection of castings. Information on foundry equipment and on the mechanization of castings production is also presented. The authors thank Professor P. P. Berg, Doctor of Technical Sciences, and staff members of the Kostankolit Plant, headed by the chief metallurgist G. I. Kletskin, Candidate of Technical Sciences, for their assistance. References follow each chapter. There are 287 references, mostly Soviet.

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L 31071-65 EWT(l)/EWG(v)/EEC-4/EEC(t) Pe-5/Pq-4 GS

ACCESSION NR: AP5006093 S/0033/65/042/001/0086/0095

AUTHOR: Mikol'skiy, G. M.

TITLE: Observations of the spectrum near the core of the fine structure of the chromosphere

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 1, 1965, 86-95

TOPIC TAGS: solar atmosphere, electron concentration, neutral hydrogen, corona, spicule, Balmer series, [illegible] photometry

ABSTRACT: A model of the solar chromosphere is developed which contains mean values of the temperature and concentration of electrons, neutral hydrogen, and neutral helium. In the summer and fall of [illegible], lines were measured with a spectrograph outside solar eclipses. The structure of the chromosphere was studied by means of spectrograms [illegible] of hydrogen and helium. The visibility of the H_β line [illegible] rapidly with height and helium lines more slowly. [illegible] were caused by photospheric light scattered on hydrogen atoms. The diffused light from the H_β line was [illegible] the height of 20,000 km. The [illegible] was investigated in [illegible] components. The ratio of the weak component to the strong one was

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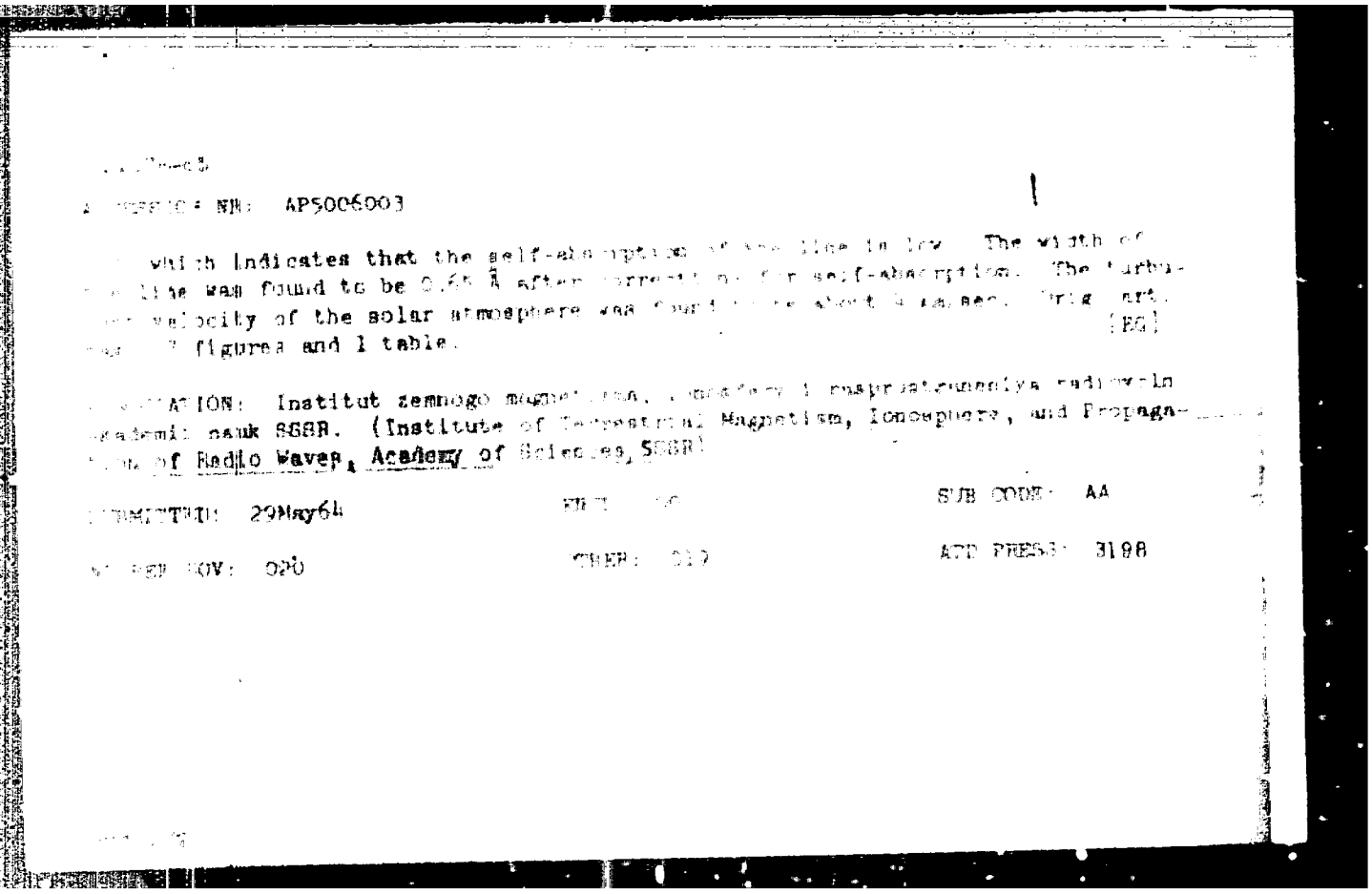

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which indicates that the self-absorption [illegible] line in [illegible]. The width of [illegible] line was found to be 0.[illegible] Å after correction for self-absorption. The turbulent velocity of the solar atmosphere was found to be about 4 km/sec. Orig. art. has: 2 figures and 1 table. [EG]

AFFILIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln Akademii nauk SSSR. (Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves, Academy of Sciences, SSSR)

SUBMITTED: 29May64 ENCL: 00 SUB CODE: AA

NO REF SOV: 020 OTHER: 012 ATD PRESS: 3198

NIKOL'SKIY, G. F., Eng.

Concrete Construction

Using pumps for cement in constructing electric power plants. Elek.sta. 23 No 5 1952

9. Monthly List of Russian Accessions, Library of Congress, October 1952. Unclassified.

NIKOL'SKIY, G. K. (Engr.)

"Hydraulic and Sand-Hydraulic Cleaning of Castings,"

report presented at Conference on Construction and Utilization of Casting Equipment. Gor'kiy, Dec 1957.
Mashinostroitel', 1958, No. 5, p. 48.

(NIILITMASH)

NIKOL'SKIY, G.Sh

PHASE I BOOK EXPLOITATION SOV/3823
SOV/20-M-7

Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy institut

Izvestiya, tom 7 (News of the Astrophysics Institute, Academy of Sciences, Kazakhskaya SSR, Vol. 7) Alma-Ata, 1958. 110 p. Errata slip inserted. 900 copies printed.

Ed.: F.Ya. Gnadchiy; Tech. Ed.: Z.P. Morokina; Editorial Board: G.M. Idlis, M.G. Karimov, Z.V. Karyagina (Secretary), D.A. Roshkovskiy, and V.G. Fesenkov (Resp. Ed.).

PURPOSE: The book is intended for astronomers and astrophysicists.

COVERAGE: This is a collection of 12 articles. In the first four articles V.G. Fesenkov deals with the formation of stars and planets, describes star chains and dark filaments in the region of galactic nebulae, and reports on the observation of Mars with an 8" refractor during the oppositior of 1956, and on photometrical observation of the northern zodiacal light in July 1957 using a visual binocular of the author's design. The remaining articles, written by different authors, deal mainly with problems of spectroscopy such as the scattering of light in the atmosphere in the nearest infrared region of the

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spectrum, oscillation of star images and its relation to the zenith distance, degree of polarization of the prismatic spectrograph, reflecting capacity of magnesium in the ultraviolet and visible regions of the spectrum, and the investigation of certain star clusters and determination of their luminosity functions. References accompany most of the articles.

TABLE OF CONTENTS:

NIKOL'SKII, G.V.

NIKOL'SKII, G.V. ...Ryby Tadzhikistana. Pod red. E.N. Pavlovskogo. Moskva, AN SSSR, 1938. 228 p. (Akademiia Nauk SSSR. Tadzhikskii filial, Stalinabad. Trudy. T. VII. Zoologiia i parazitologiia).
"Literatura": p. 226.
CU NN DLC: DK861. T3A13

SO: LC, Sovit Geography, Part II, 1951, Unclassified

NIKOL'SKIY, Georgiy V.

The fishes of the Aral Sea. Moskva, 1940. 216 p. (Materialy k poznaniiu fauny i flory SSSR. Otdel Zoologicheskii.vyp. 1)

NIKOL'SKIY, G. V.

"The Biology of Fishes," Moscow, 1944

[redacted], G. V. [redacted]

USSR/Potamology May 1947
Ichthyology

"An Expedition of the Zoological Institute of the Moscow University to the River Amur," G. V. Nikol'skiy, 3 pp

"Priroda" No 5

1945 and 1946 expeditions sponsored by Ministry of the Fishing Industry of the USSR to determine exactly the habitats of the fish of that area.

16760

NIKOL'SKIY, Georgiy Vasil'skiy

"The Loaches of Inland Waters of Turkmen SSR," Byul. Mosk. Obshch. Ispytat. Prirody, Otdel. Biol., 52, No.3, 1947

NIKOL'SKIY, G. V. TA 60T69

USSR/Medicine - Fish Jun 1947
Medicine - Taxonomy

"The Order Hemiculter (Pisces, Cyprinidae) in the Amur Basin," G. V. Nikol'skiy, 3½ pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVI, No 7

Material collected by Amur Expedition of Moscov State University. Briefly describes characteristics of Hemiculter located in Amur River basin. Submitted by Academician L. S. Berg, 26 Dec 1946.

60T69

NIKOL'SKIY, G. V.

Nikol'skiy, G. V. and VOLK, A. M. - "Data relating to the hydrobiology of the lowland part of the Syr-Dar'ya river bed," In symposium: Pamyati Akad. S.A. Zernova, Moscow-Leningrad, 1948, p. 132-43 - Bibliog: 24 items

So: U-3600, 10 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 6, 1949).

NIKOL'SKIY, G. V.

"Information on Zoology in the Popular Geographic Literature," Priroda No.6, 19[illegible]

NIKOL'SKIY, G. V.

TA 6473

Biology/Medicine - Zoology Mar/Apr 1948
Medicine - Environment

"The Perception of Special Features in the Formation and Development of Ichthyofauna in Water Reservoirs in Various Geographical Zones of the USSR," G. V. Nikol'skiy, Ichthyological Lab, Zool Inst, Moscow State U, 10 pp

"Zool Zhur" Vol XXVII, No 2

Explains formation of ichthyofauna in various watersheds, which are closely allied to definite geographical zones. Materials obtained during studies conducted from 1941 to 1945 at Uchinsk and Murgaba.

68473

NIKOLSKIY, G. V.

PA47T55

[redacted] - Fish 1 Mar 1948
Medicine - Taxonomy

"Sheatfish (Family Siluridae) of the Amur Basin," G. V. Nikol'skiy, S. G. Soin, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LII, No 7

During field study by the Amur expedition of Moscow University in 1947, 12 examples of sheatfish obtained having three pairs of antennas, and sharply distinguished from Parasilurus asotus in general appearance. More detailed study showed that fish undoubtedly representative of genus Silurus, but distinguished both from Silurus sinensis Hora and from the European Silurus glanis. Describes structure of fish in detail. Submitted by Academician L. S. Berg, 6 Jan 1948. [redacted]

47T55

USSR/Medicine - Fish Jan/Feb 49
Medicine - Food

"Regularities of Intraspecie Food Habits of Fresh-Water Fish," G. V. Nikol'skiy, 14 pp

"Byul Mosk Obshch Ispy Prirod, Otdel Biolog" Vol LIV, No 1

Concludes that most intense feeding in any form occurs in period when the form is best supplied with food. In one form, this occurs in summer; in another, in winter.

[redacted]

41/49T45