On the Theory of Motion of Ionospheric Irregularities

follows that Eqs (23) and (24) are acceptable solutions. The final velocity ratios obtained are given by Eqs (30)and (31), where k is the ratio of the electron concentration in the surrounding medium to the electron concentration in the cylinder, and G is given by Eq (16). A discussion of these equations leads to the conclusion that in the region of the D-layer and the lower part of the E-layer the ionized gas moves with the velocity of the wind. Drift velocities are lower than the wind velocity by a factor of 10^{-3} or 10^{-4}. In the F-layer the velocity of uniformly ionized masses is appreciably different from the velocity of the wind. The difference is approximately 10% of the latter velocity. The transverse component of the drift velocity falls off very rapidly. Polarization corrections are also shown to be very small compared with drift velocities. Acknowledge-

On the Theory of Motion of Ionospheric Irregularities

ments are made to Prof. V. L. Ginzburg and B. N. Gershman for a number of valuable suggestions and interest respectively. There are 15 references, of which 6 are Soviet and 9 are English.

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet (Gor'kiy State University)

SUBMITTED: October 5, 1957.

DOKUCHAYEV V. P.

В. Л. Гершман,
В. Н. Михайлов

О применении спектральной теории турбулентности к задачам рассеяния от неровностей поверхности моря при волнении.

Б. Е. Кинбер,
М. Ф. Бахарева,
Т. Г. Тушкевич

Функция распределения уровня сигнала (медленные замирания).

10 июня
(с 10 до 16 часов)

Б. Н. Гершман,
В. П. Докучаев

К теории образования ионосферных неоднородностей в слое

В. Д. Гусев,
Ю. В. Кушнеревский,
С. Ф. Миркотан

Сопоставление результатов наблюдения за крупными и мелкими неоднородностями в слое F_2.

В. Д. Гусев,
С. Ф. Миркотан,

Ю. В. Березин,
М. П. Кияновский

О «разрешающей способности» систем, измеряющих горизонтальные размеры ионосферных неоднородностей

В. Д. Гусев,
М. Б. Виноградова,
Т. А. Гайлит

Статистические свойства фазы волны, отраженной от ионосферы.

В. Д. Гусев,
Т. А. Гайлит

Об автоматизации обработки экспериментальных данных при исследовании нерегулярной ионосферы

10 июня
(с 18 до 22 часов)

В. А. Бородулько

Расчет надежности связи высокоширотных радиотрасс.

Ш. Г. Шляпоберский

Графо-аналитический способ расчета линий радиосвязи для различных условий работы.

report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNORiE), Moscow, 8-12 June. 1959

DoKuCHAYEV, V.P.

14(10); 3(5) PHASE I BOOK EXPLOITATION SOV/2843

Soveshchaniye po ratsional'nym sposobam fundamentostroyeniya na vechnomerzlykh gruntakh

Trudy... (Transactions of the Conference on Efficient Methods of Building Foundations on Permafrost Soils) Moscow, Gosstroyizdat, 1959. 131 p. Errata slip inserted. 1,200 copies printed.

Ed. of Publishing House: N. M. Borshchevskaya; Tech. Ed.: Ye. L. Temkina.

PURPOSE: This book is intended for construction engineers, industrial planners and builders.

COVERAGE: This book contains reports originally read in Vorkuta in 1958 on experience gained in planning and building foundations in permafrost regions of the USSR. The reports were prepared for publication in the NIIOSP (Scientific Research Institute for the Study of Foundations and Underground Structures). The Introduction was written by Professor V. G. Bulychev. No references are given.

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9,9100

AUTHORS: Gershman, B.N. and Dokuchayev, V.P.

TITLE: On the Theory of Formation of Ionospheric Irregularities in the F-layer

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1959, Vol 2, Nr 6, pp 843 - 847 (USSR)

ABSTRACT: An analysis of recent papers (Refs 1-3) shows that one of the most difficult problems in the theory of the ionosphere is the theoretical interpretation of the origin of irregularities in the F-layer. In the present paper the authors are concerned with the mechanism originally put forward by Martyn in Ref 4 and later analysed in detail by Dagg (Ref 5). In their papers, Martyn and Dagg have only formulated the above hypothesis but have not given any quantitative estimates. The present authors start with the microscopic equation for the electric field $\underline{E}$ given by Eq (1), where $\underline{j}$ is the total microscopic current. This equation is written down for the case when:

$$\text{div } \underline{E} = 4\pi e(N_i - N_e) \simeq 0$$

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On the Theory of Formation of Ionospheric Irregularities in the F-layer

where $-e$ is the electronic charge and N_e and N_i are the concentrations of electrons and ions, respectively.

The latter condition is satisfied for a quasi-neutral plasma, in which case $N_e \simeq N_i$. The current $\underline{j}$ is related to the field $\underline{E}$ by the generalised Ohm's law which, for quasi-static processes may be written in the form given by Eq (2), where $\underline{h}$ is a unit vector in the direction of the field $\underline{H}_o$, which is the magnetic field due to the Earth. Since in the general case the medium is in motion, Eq (2) includes not the field $\underline{E}$ but the field $\underline{E}'$, defined by Eq (3), where $\underline{E}_A = [\underline{v}\underline{H}_o]/c$ and $\underline{v}$ is the velocity of the medium. In Eq (2) σ_o, σ_1 and σ_2 are the longitudinal and transverse conductivities and the Hall conductivity, respectively, and are given by Eq (4). In Eq (4) ν_e is the effective number of

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On the Theory of Formation of Ionospheric Irregularities in the F-layer

collisions between electrons and other particles, ν_i are the number of collisions for ions, ω_H and Ω_H are the gyro-frequencies for electrons and ions, m and M are the mass of electrons and ions and $N \equiv N_e \simeq N_i$.

Eq (1) can be written in the form given by Eqs (5), (6) and (7) if Eq (2) is taken into account and the coordinate axes are defined as follows. The x-axis is directed towards the geomagnetic equator, the y-axis is eastwise and the z-axis is taken vertically upwards. In these coordinates the Earth's magnetic field can be written in the form:

$$\underline{H}_o = H_o \underline{h} = - H_o \cos\chi \underline{i} - H_o \sin\chi \underline{k} \quad .$$

These equations are applied to the case which is found to hold in the ionosphere above 130 km. In that region it may be assumed that $\sigma_2 \simeq 0$ and σ_o and σ_1 are given by Eq (8). Moreover, $\nu_i > \Omega_H$. The discussion

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On the Theory of Formation of Ionospheric Irregularities in the F-layer

is then specialised to the case of $\chi \approx 90^{\circ}$ and $\chi = 0$. Under these conditions, and using the above approximations, the appropriate equations for the electric-field components are given by Eqs (9) and (10), from which it follows that it is necessary to solve two types of partial differential equations, i.e. those given by Eqs (11) and (12). The solution is sought in the form given by Eq (13), where k can, in general, be complex. Substituting Eq (13) into Eqs (11) and (12), Eqs (14) and (15) are obtained, and using the substitution $x = \exp(z/z_o)$ in Eq (14) and $x = \exp(-z/z_o)$ in Eq (15), the solutions given by Eqs (16) and (17) are obtained, where $H_\nu^{(1,2)}$ are the Hankel functions of the first and second kind, and the other symbols are defined at the top of p 846. When the boundary conditions are taken into account, and it is assumed that the fields are generated in the E-layer

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without any discontinuities and fast changes in the properties of the medium, the final form of the solutions is given by Eqs (18) and (19). These equations are used to show, using the data reported by Martyn in Ref 6, that only the transport of large-scale irregularities in the electric field is possible. It is concluded that the Martyn-Dagg mechanism can explain the formation of more-or-less regular motions in the F-layer but is incapable of ensuring the formation in this layer of irregularities on the scale of the order of 2 - 4 km. There are 7 references, 5 of which are English and 2 Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific-research Radiophysical Institute of Gor'kiy University)

SUBMITTED: July 13, 1959

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69413

S/141/60/003/01/004/020
E032/E414

9.9000

AUTHOR: Dokuchayev, V.P.

TITLE: Diffusion in Meteor Trails

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol 3, Nr 1, pp 50-56 (USSR)

ABSTRACT: It is well known that when meteroic particles pass through the upper atmosphere (at an altitude of about 80 to 120 km) clouds of enhanced ionization having approximate cylindrical form are produced. These ionized columns disappear as a result of diffusion, recombination, turbulent mixing and a number of other factors. It has been established that diffusion is the most important. It is assumed that the diffusion of charged particles in meteor trails is of ambipolar character and can be anisotropic because of the presence of the earth's magnetic field. In order to calculate the diffusion coefficients, the author uses the quasi-hydrodynamic equations which describe the motion of charged particles in a weakly ionized plasma (Ref 8)

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Diffusion in Meteor Trails

and which are given by Eq 3 and 4. Neglecting terms containing time derivatives, it is easy to show from these two equations that the electron and ion current densities are given by Eq (5) and (6) respectively. Starting these equations, it is shown that the diffusion coefficients in the direction parallel and perpendicular to the magnetic field are given by Eq (15) and (16) where σ is the conductivity and e and i refer to the electrons and the ions respectively; N is the charge density and $\varkappa$ is Boltzmann's constant. It may be concluded from this formula that the diffusion coefficients, both parallel and perpendicular to the magnetic field, are determined by the charged particles with the lowest mobility. If one assumes that the product of the particle mass and the effective number of collisions with air molecules is much greater for the ions than for the electrons, then the diffusion coefficients are given by the simpler equations (17) and (18), where $\omega = eH_0/mc$. From this expression for

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the diffusion coefficient $D_\perp$ it may be deduced that the criterion according to which the magnetic field has an appreciable effect on the process of ambipolar diffusion is given by Eq (19) where ν is the collision frequency. If the condition given by Eq (19) is satisfied, $D_\parallel$ becomes greater than $D_\perp$, ie the process becomes anisotropic. It is also shown that the ratio of the linear dimensions of irregularities in the electron concentration in the ionosphere in directions perpendicular and parallel to the magnetic field, are equal to the square root of the ratio of the corresponding diffusion coefficients. Thus, the study of the effect of the earth's magnetic field on the diffusion process in meteor trails is closely connected with the problem of anisotropy of small-scale irregularities in the ionosphere. It is just in the region where ionized meteor trails are formed (90 and 120 km) that the transition takes place from isotropic to anisotropic diffusion. Above 110 km, the anisotropy due to the magnetic field is quite strong. However, Eq (17) and (18) are quite general

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and apply to the transition region. The present theory is in agreement with the results of Greenhow and Neufeldt (Ref 12). Acknowledgements are made to B.N.Gershman for constant interest and discussion of results. There are 1 figure and 12 references, 2 of which are Soviet, 1 a translation from English and 9 English.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radio-Physical Institute of the Gor'kiy University)

SUBMITTED: January 29, 1959

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9.9100
9.9000

80870
S/141/60/003/02/004/025
E032/E314

AUTHOR: Dokuchayev, V.P.

TITLE: On the Scattering of Radio Waves by Long-lived Ionized Meteor Trails

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol 3, Nr 2m pp 199 - 207 (USSR)

ABSTRACT: Two hypotheses have been advanced as to the mechanism whereby radio waves are scattered from trails with high electron concentration. The first of these is due to Herlofson (Ref 2) and was developed in detail by Kaiser and Closs in Ref 3. It assumes that a trail having a high electron concentration scatters radio waves in a way similar to the scattering of such waves by a metallic cylinder. According to the second hypothesis put forward by Booker and Cohen (Ref 4), there are small-scale electron density irregularities in the region of the trail which appear as a result of turbulent motion in the surrounding medium. According to this mechanism the scattering of radio waves by the statistical irregularities has a non-coherent character. It is shown in the present paper that during most of their lifetime the trails scatter radio

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On the Scattering of Radio Waves by Long-lived Ionized Meteor Trails

waves similarly to a metallic cylinder (Herlofson and Kaiser theory). The non-coherent scattering mechanism theory put forward by Booker and Cohen does not agree with experimental data on the time-distribution of reflections. This is the case both in sporadic meteors and meteors in streams. The turbulent diffusion mechanism leads to a rapid disappearance of tracks even with a very high initial electron density which is indicated by experimental data and is easily understood on the basis of physical considerations. An increase in the diffusion coefficient should lead to a rapid disappearance of the trail and should reduce rather than increase the number of long-lived trails and the reflections from them. Moreover, there are days when ionospheric stations indicate the absence of strong turbulent flow in the E layer of the ionosphere. According to Booker's hypothesis there should be a reduction in the number of long reflections from meteor trails during such days. However, such a strong correlation between these two phenomena does not appear to have been established. The paper is concluded with an attempt to explain the fading

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of the reflected signal amplitude in terms of the Kaiser-Closs mechanism. It is shown that the fading is due to the diffraction of radio waves by strongly-ionized meteor trails.
Acknowledgment is made to B.N. Gershman for reading the manuscript of the present paper.
There are 5 figures and 16 references, of which 4 are Soviet, 11 English and 1 is Swedish.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific-research radiophysics Institute of Gor'kiy University)

SUBMITTED: September 10, 1959

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9.9842

86865
S/141/60/003/005/020/026
E032/E314

AUTHOR: Dokuchayev, V.P.

TITLE: The Effect of Geomagnetic Disturbances on the Drift of Ionised Gas in the Upper Atmosphere

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol. 3, No. 5, pp. 901 - 903

TEXT: Fig. 1 shows experimental data on the correlation between drift velocities in various regions of the ionosphere and geomagnetic disturbances. This figure gives plots of the drift velocity V_p (in m/sec) as a function of the mean amplitude of the geomagnetic disturbances. These experimental results are plotted for three regions, namely, the E-layer, the F-layer and the R-layer (the latter causes fluctuations in the intensity of the emission of radio stars). The relation is linear in each of these three regions. The slopes of the straight lines increase with altitude of the layer. Finally, the intercepts on the V_p axis also increase with the altitude of the layer. These experimental results can be simply explained on the basis of the relation between geomagnetic

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disturbances and the drift velocities. It is well known that geomagnetic disturbances are due to the interaction between solar corpuscular streams and the outer atmosphere (exosphere) (Refs. 5-7). Low-frequency disturbances in the exosphere, having a quasi-period greater than 10 sec are of a magneto-hydrodynamic character. These disturbances are propagated into the underlying regions of the atmosphere, and into the ionosphere, by diffusion of electromagnetic waves, and on reaching the Earth's surface give rise to variations in the geomagnetic field. On the other hand, it is also known that an electric field gives rise to the drift of the ionised gas in the iono-sphere. Thus, solar corpuscular streams excite magnetohydro-dynamic disturbances in the exosphere which are propagated through the ionosphere in the form of electromagnetic waves and produce variations in the geomagnetic and electric fields on the Earth's surface. Electric fields associated with these disturbances give rise to the drift of the ionised gas when

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they are propagated through the ionosphere. It is shown that the relation between the drift velocity and the mean amplitude of disturbances in the magnetic field is of the form:

$$V_p = \left[\frac{H_o^2}{4\pi\rho_p c} \frac{\sqrt{2\pi\sigma_\perp \omega}}{\nu_{im}} \right] \frac{h}{H_o} \qquad (5)$$

where H_o is the Earth's magnetic field,

$\sigma_\perp$ is the electrical conductivity of the medium in a direction perpendicular to H_o ,

ρ_p is the ion density in the plasma,

ν_{im} is the number of collisions between ions and molecules, and

ω is the angular frequency of the electromagnetic field.

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This formula is in good agreement with the experimental results for the E-region.
There are 1 figure and 10 references: 2 Japanese (in English), 5 English and 3 Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute of Gor'kiy University)

SUBMITTED: June 23, 1960

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3.1560

78015
SOV/33-37-1-15/31

AUTHOR: Doktuchayev, V. P.

TITLE: Formation of an Ionized Meteor Trail

PERIODICAL: Astronomicheskiy zhurnal, 1960, Vol 37, Nr 1, pp 111-114 (USSR)

ABSTRACT: When a "burning" meteor particle moves in the upper atmosphere, atoms from this particle evaporate, become ionized, and together with electrons form a cloud of quasi-neutral plasma. The author considers cases in which the meteor track makes an angle of more than 70° with respect to the vertical and in which the coefficient of diffusion, D, the velocity, V, and the energy in the trail, Q_o, do not change with altitude. If only meteors below 100-km altitude are considered, then the process of diffusion may be regarded as isotropic. If N is the concentration of the plasma in cm^3, and z is the coordinate along the trajectory, then

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$$N(0,z,t)=\begin{cases}\dfrac{Q_0}{4\pi D|z-Vt|}\cdot e^{-\frac{Vt-|Vt|}{D}} & \text{at } z>Vt\\ \dfrac{Q_0}{4\pi D|z-Vt|} & \text{at } z<Vt.\end{cases} \qquad (10)$$

This indicates that in the immediate vicinity of the meteor the concentration of the ionized gas is much greater than in the atmosphere around it; furthermore, the concentration in front of the meteor decreases exponentially, but in the trail behind the meteor it decreases much more gradually. The "running echo" observed by radar results from differences in dispersions in parts of the trail: near the flying meteor the concentration may exceed the critical value necessary for the radio wave reflection, but in other parts it is smaller than this value. The author rejects the theory of McKinley and Millman who explain this effect by an increase in the radiation at the expense of the ultraviolet radiation. There are 9 references, 6 Soviet, 2 U.K., 1 U.S. The U.S. and U.K.

Formation of an Ionized Meteor Trail

78015
SOV/33-37-1-15/31

references are: L. A. Manning, J. Geoph. Res., 63, 181 (1958); T. R. Kaiser, R. L. Closs, Phil. Mag., 43, 336 (1952); D. W. R. McKinley, P. M. Millman, Proc. I.R.E., 37, 364 (1949).

ASSOCIATION: Scientific-Research Radiophysical Institute at the Gor'ky University (Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom un-te)

SUBMITTED: March 30, 1959

Card 3/3

S/056/60/039/002/029/044
B006/B056

26.2311
24.2120

AUTHOR: Dokuchayev, V. P.

TITLE: The Growth of Magnetohydrodynamic Waves in a Plasma Flow Moving Through an Ionized Gas

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 2(8), pp. 413-415

TEXT: The author investigates magnetohydrodynamic waves propagating in a plasma moving at a velocity $\vec{V}_o$ through a gas at rest, which is completely ionized and quasi-neutral. The gas is assumed to be in an external magnetic field $\vec{H}_o$; $\vec{V}_o \parallel \vec{H}_o$. The formation of high-frequency electromagnetic waves in the motion of electron and ion currents in a plasma has repeatedly been investigated. Here, the conditions are determined under which magnetohydrodynamic waves increasing with time (as a consequence of which the system becomes unstable) are formed in the system current - plasma at rest. Proceeding from the system of the linearized equations (1) - (6), which describes the electrodynamic processes of the system investigated, the author obtains the dispersion equation (7) for plane electromagnetic waves

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B006/B056

propagating in the direction of current, i.e., in the direction of the magnetic lines of force of the H_o field. The sign + in (7) corresponds to the ordinary, and the sign - to the extraordinary wave. The author then investigates the ordinary hydrodynamic approximation - the case of very low frequencies ($\omega \ll \Omega_H$, $\omega/k \ll c$), where collisions are neglected. With $kV_o \ll \Omega_H$, ($\Omega_H = eH_o/m_i c$, m_i - ion mass) the simple relation (8) is obtained from the dispersion equation (7): $k^2 = (\omega - kV_o)^2/V_{As}^2 + \omega^2/V_{Ap}^2$. V_{As} and V_{Ap} are the velocities of the Alfvèn waves: $V_{As}^2 = \omega_H \Omega_H c^2/\omega_{se}^2 = H_o^2/4\pi\varrho_s$; $V_{Ap}^2 = H_o^2/4\pi\varrho_p$. ($\omega_H = eH_o/m_e c$ denotes the gyrofrequency of the electron; the subscript s refers to quantities holding in the flow, p to such holding in the plasma at rest; the subscripts e and i relate to electrons and ions, respectively). The solution of (8) is

$$\frac{\omega}{k} = \frac{V_o \pm V_A \sqrt{(N_p/N_s)(1 - V_o^2/V_A^2)}}{1 + N_p/N_s}, \text{ with } V_A^2 = V_{As}^2 + V_{Ap}^2; \text{ (N - particle number).}$$

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If, thus $V_0 > V_A$, ordinary waves occur, which grow with time, and the system becomes unstable. The author finally thanks Professor A. V. Gaponov, G. G. Getmantsev, B. N. Gershman, and V. V. Zheleznyakov for discussions. There are 8 references: 7 Soviet and 1 US.

ASSOCIATION: Radiofizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta
(Institute of Radiophysics of Gor'kiy State University)

SUBMITTED: March 8, 1960

4

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68809

3.1550

AUTHOR: Dokuchayev, V. P.

S/020/60/131/01/021/060
B013/B007

TITLE: The Electric Discharge in the Flight of Meteors in the Atmosphere of the Earth

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 1, pp 78 - 81 (USSR)

ABSTRACT: On the basis of experimental material the author develops formulas for the amperage and its increase in corona discharges and lightning-like spark discharges, occurring during the falling of meteors and meteorites. Various experimental data are indicative of the fact that an electric discharge occurs when meteors fly through the upper strata of the terrestrial atmosphere. For such a discharge a mechanism is, however, necessary, which explains the existence of sufficiently strong electric fields. The field strength E of these fields must be greater than the breakdown field strength. The gas discharge in the ionosphere, applied to polar light phenomena, was investigated by A. I. Lebedinskiy (Refs 5,6) and O. R. Wulf. During the passage of a meteor through the upper layers of the atmosphere a highly ionized track is formed, which consists essentially of electrons and ions of the meteor-material (meteor-

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plasma). Electron concentration in the track is greater by some orders of magnitude than electron concentration in the surrounding ionospheric plasma. Therefore, a meteor particle probably leaves a cloud of highly conductive gas behind it, and this cloud is then surrounded by a gas of considerably lower conductivity. This cloud has the shape of a very long cylinder with the average length of $l = 10$ km and a radius of 5 m. In order to be able to estimate the intensification of the electric field near the ends of the meteor track, it is approximated by a long-stretched ellipsoid of revolution. For the intensified electric field $E_{max} = \left(\frac{l}{r_t}\right)^2 \frac{E_o}{\lg(2l/r_t)-1}$ holds. Here $r_t^2 = 4Dt + r_o^2$ denotes the effective radius of the track, D - the diffusion coefficient, and r_o - the initial track radius. The intensification of the field E_o, in which the moving meteor forms its ionizing track, will be the most intense in the head part of the track. The sur-

face force $E^2/4\pi$ acting on the side of the intensified field upon the polarized surface charges, is not greater than the partial pressure of the meteor-plasma, nor does it show a noticeable mechanical effect upon a track with the electron density $N_0 \leqslant 10^{10}$ el/cm^3. An expression for the breakdown value of the electric field strength is then given. From what has hitherto been said, the following conclusions may be drawn: The aureola abutting against the moving meteor is a consequence of the coronizing of the head part of the ionizing track. The corona comprises the entire region of the inhomogeneous electric field and has a diameter of the order of 1 to 2 km. When bright meteors fly through strong electric fields, the corona-like discharge may develop to a spark-like flash of lightning. The development of the spark-channel is rendered easier by the presence of a conductive cylindrical track. The radio-emission of the corona- and of the spark-discharge will disturb longwave reception. The author approximatively calculates the electric amperage for the case of electric breakdown. On this occasion, amperage increases

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B013/B007

its amount by three-fold. During the falling of meteorites several observers saw St. Elmo's fires and electric discharges. There are 14 references, 10 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete im. N. I. Lobachevskogo (Scientific Radio-physical Research Institute at Gor'kiy State University imeni N. I. Lobachevskiy)

PRESENTED: October 22, 1959, by V. G. Fesenkov, Academician

SUBMITTED: July 23, 1959

4

DOKUCHAYEV, V. P.

Cand Phys-Math Sci - (diss) "Several problems of the electrodynamics of the atmosphere." Moscow, 1961. 9 pp; (Academy of Sciences USSR, Inst of Atmospheric Physics); 200 copies; price not given; bibliography on pp 8-9 (17 entries); (KL, 6-61 sup, 193)

25941
S/141/61/004/001/001/022
E032/E314

9,9100

AUTHOR: Dokuchayev, V.P.

TITLE: The Motion of Ionised Gas in the Upper Atmosphere (A Review)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol. 4, No. 1, pp. 5 - 39

TEXT: The aim of the present paper is to give a comprehensive but, at the same time, short review of the theory of motion and mechanisms of formation of ionospheric irregularities in the upper atmosphere. The review is divided into the following sections:
1) the system of electrodynamic equations for a partly ionised gas;
2) winds in the upper atmosphere;
3) drift of plasma in the upper atmosphere;
4) motion of irregularities in the electron concentration in the ionosphere;
5) regular motions in the ionosphere;
6) origin of ionospheric irregularities in the E- and

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V

The Motion of ....

F-layers;
7) hydrodynamic relation between the ionosphere and the outer atmosphere (exosphere).
There are 6 figures and 156 references: 46 Soviet and 111 non-Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute of Gor'kiy University)

SUBMITTED: August 24, 1960

Card 2/2

43546

S/033/62/039/006/010/024
E032/E514

3,2430

AUTHOR: Dokuchayev, V.P.

TITLE: Magnetohydrodynamic instability of solar corpuscular streams

PERIODICAL: Astronomicheskiy zhurnal, v.39, no.6, 1962, 1009-1013

TEXT: The motion of solar corpuscular streams in inter-planetary gas is considered. It is shown that corpuscular streams moving in the super-corona are unstable with respect to magnetohydrodynamic perturbations. This result is established on the following assumptions: 1) the plasma in the stream and in the super-corona is quasi-neutral and fully ionized; 2) electron-ion collisions are neglected both in the super-corona and in the stream; 3) the electrodynamic processes in the stream and in the medium are described by the linearized set of equations given in the previous paper (Zh. eksperim. i teor. fiz., 39, 413, 1960). The latter equations are used to derive a dispersion relation for plane electromagnetic waves propagating along the stream. Analysis of this relation shows that when the velocity of the solar corpuscular stream exceeds the Alfven wave velocity $H_o/(4\pi\rho)^{1/2}$,

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the stream-medium system becomes unstable. The time taken for the stream to disintegrate is of the order of τ which is given by

$$\tau = \frac{1}{\gamma} = \frac{N_p + N_s}{kV_o\sqrt{N_p N_s}} \qquad (14)$$

where N_s and N_p are the plasma concentrations in the stream and in the super-corona. The theoretical considerations are shown to be consistent with experimental data.

ASSOCIATION: Radiofizicheskiy institut Gor'kovskogo gos. universiteta imeni N. I. Lobachevskogo (Radiophysics Institute of the Gor'kiy State University imeni N. I. Lobachevskiy)

SUBMITTED: November 29, 1961

39491
S/056/62/043/002/033/033
B104/B108

3.2310

AUTHOR: Dokuchayev, V. P.

TITLE: The theory of sound-wave emission during the motion of small bodies in gaseous media

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 2(8), 1962, 595-604

TEXT: The hydrodynamic disturbances arising when a solid moves through a gas are investigated. The dimensions of such solid bodies are assumed to be smaller than the mean free path in the gas. From the hydrodynamic equations

$$\rho dv/dt = -\nabla p + f, \qquad (1.1)$$

$$dp/dt + p\,\mathrm{div}\,v = 0, \qquad (1.2)$$

$$\delta p = c_s^2 \delta\rho, \qquad (1.3)$$

one finds

$$\frac{\partial^2\rho}{\partial r^2} + \frac{1}{r}\frac{\partial\rho}{\partial r} + \frac{\partial^2\rho}{\partial z^2} - \frac{1}{c_s^2}\frac{\partial^2\rho}{\partial t^2} = \frac{F}{\pi c_s^2}\frac{\delta(r)}{r}\frac{\partial}{\partial z}\delta(z - V_0 t). \qquad (1.12).$$

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The theory of sound-wave emission...

This equation is subjected to a Fourier-Hankel transformation, which leads to the solution

$$\rho(r,\xi)=\frac{iF}{2\pi^2 c_s^2}\int_0^{+\infty}\int_{-\infty}^{+\infty}\frac{\varkappa k e^{-i\varkappa\xi}J_0(k,r)}{k^2+\gamma^2\varkappa^2}\,dkd\varkappa. \qquad (2.5).$$

$\vec{v}$, ϱ and p are velocity, density and pressure in the medium, c_s is the velocity of sound, $\vec{f}$ is an external force acting upon the gas by the moving particles. In the subsonic range, substantial density disturbances occur only in the vicinity of the particles. Sound is emitted during supersonic velocities of the particles. This emission is analyzed, the resistance produced by the emission is calculated, and the emission arising when particles pass through the boundary of two media with different densities is especially investigated.

ASSOCIATION: Radiofizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta (Institute of Radiophysics of Gor'kiy State University)

SUBMITTED: March 5, 1962

Card 2/2

S/203/63/003/002/013/027
D207/D307

AUTHORS: Grigor'yev, G.I. and Dokuchayev, V.P.

TITLE: The effect of the diurnal variation of ionospheric electrical conductivity on the spectrum of geomagnetic S_q variations

PERIODICAL: Geomagnetizm i aeronomiya, v. 3, no. 2, 1962, 293-296

TEXT: In the dynamo-theory of variations of the geomagnetic field it is assumed that regular quiet diurnal variations of this field S_q are due to systems of electrical currents produced by the motion of electrically conducting air masses in the upper atmosphere under the action of wind. The present article deals with the influence of the secular variation of the electrical conductivity in the dynamo region of the ionosphere (100-130 km) on the spectrum of diurnal variations of the geomagnetic field. It is shown that this influence is very considerable: the spectra of geomagnetic variations for constant conductivity and for conductivity varying with

Card 1/2

The effect of the diurnal ...

time are not identical. Acknowledgement is made to B.N. Gershman for discussion. There is 1 figure.

ASSOCIATION: Radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete (Radio Physics Institute at Gor'kiy State University)

SUBMITTED: September 15, 1962

L 15715-63 EWT(1)/EWG(k)/BDS/ES(w)-2 AFFTC/ASD/ESD-3/AFWL/IJP(C)/SSD Pz-4/
Pab-4/Pi-4/Po-4 AT
ACCESSION NR: AR3002654 S/0124/63/000/005/B010/B010

SOURCE: Rzh. Mekhanika, Abs. 5B44

AUTHOR: Dokuchayev, V.P.

TITLE: Magneto hydrodynamic instability of a plasma current which moves through an ionized gas

CITED SOURCE: Sb. Vopr. magnitn. gidrodinamiki i dinamiki plazmy. v. 2. Riga, AN LatvSSR, 1962, 299-306

TOPIC TAGS: magnetohydrodynamics, instability, plasma, current, ionized gas, waves, Alfven wave

TRANSLATION: A system of two mutually penetrating plasma currents with particle concentrations N_s and N_p is considered. The presence of a homogeneous magnetic field H_o parallel to the relative velocity of the current V_o, is assumed. A study is made of the stability of such systems relative to the low frequency electromagnetic waves at the limit of their degeneration into magnetohydrodynamic waves.

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As a result of the linearization of the system, consisting of the hydrodynamic equation of motion of the plasma, the generalized Ohm's Law and Maxwell's electrodynamic equations, the following dispersion relations are obtained:

$$\omega^2 - c^2k^2 = \frac{\omega_{se}^2 (\omega - kV_0)}{\omega - kV_0 \pm \omega_H - i\nu_{ei}^s - [\omega_H \Omega_H / (\omega - kV_0)]} + \frac{\omega_{pe}^2 \omega}{\omega \pm \omega_H - i\nu_{ei}^p - (\omega_H \Omega_H / \omega)} \quad (1)$$

where ω is the frequency, k is the wave number, and ω_{se} and ω_{pe} are the plasma frequencies of electrons in the mutually penetrating currents, Ω_H is the ion gyrofrequency, ν_{ei} is the number of electron-ion collisions, c is the speed of light, the + sign corresponds to the ordinary wave and the - sign to the extraordinary. In the case, $\omega \ll \Omega_H$, $kV_0 \ll \Omega_H$, from relation 1, it follows

0

$$k^2 = \frac{\omega^2}{c^2} + \frac{\omega^2}{V^2_{Ap}} + \frac{(\omega - kV_0)^2}{V^2_{As}} \qquad (2)$$

where V_{Ap} and V_{As} are the velocities of Alfven waves. From the analysis of the solution of equation 2 it is found that for the fulfillment of the conditions

$$N_s N_p > N_0(N_s + N_p + N_{kp}) \qquad (3)$$

waves are formed in the system of mutually interpenetrating currents, increasing with time. (here $N_0 = H_0^2/4\pi m_i V_0^2$, $N_{kp} = H_0^2/4\pi m_i c^2$, m_i the ionic mass is m. If it is further assumed that $N > N_{kp}$, then condition 3 may be written in the form

$$V_0^2 > V_A^2 = V_{As}^2 + V_{Ap}^2 \qquad (4)$$

From this it follows that the magnetohydrodynamic instability arises in the case when the relative velocity increases the speed of propagation of the Alfven waves in the plasma.

L 15715-63
ACCESSION NR: AR3002654

For the growth coefficient of one of the normal hydrodynamic waves in the plasma the following expression is obtained

$$\gamma = kV_0 \frac{\sqrt{N_p N_s - N_0(N_s + N_p + N_{kp})}}{N_s + N_p + N_{kp}} \qquad (5)$$

the analysis of which shows that γ has a maximum if the inequality is fulfilled. For

$$N_p = (N_s + N_{kp}) \frac{N_s + N_0}{N_s - N_0} \qquad (6)$$

from expression 5 it follows that $\gamma_{max} = kV_0/2$, that is, the coefficient of growth attains a maximal value in the case when the concentrations of particles in the interpenetrating currents are nearly identical. Bibliog. 12 citations.
Yu. N. Denisov

DATE ACQ: 14Jun63 SUB CODE: PH, NS ENCL: 00

Card 4/4

DOKUCHAYEV, V.P.

"Fundamentals of cosmic electrodynamics" by S.B. Pikel'ner. Reviewed by V.P. Dokuchaev. Astron. zhur. 40 no.3:587-588 My-Je '63. (MIRA 16:6)

(Cosmic physics)
(Pikel'ner, S.B.)

ACCESSION NR: AP4017610 S/0033/64/041/001/0033/0043

AUTHOR: Dokuchayev, V. P.

TITLE: Magnetoacoustic radiation during the motion of stars in space

SOURCE: Astronomicheskiy zhurnal, v. 41, no. 1, 1964, 33-43

TOPIC TAGS: star, stellar motion, magnetoaccoustic radiation, Mach wave, Cherenkov emission, stellar wind

ABSTRACT: On the basis of expressions developed by the author, which were solved by means of Fourier transformation and the technique applied in the analysis of the Cherenkov effect, he considers the gravitational and corpuscular interaction of a moving star with the ionized magnetoactive space gas. Cherenkov emission of Mach magnetoacoustic waves was found to occur when $v_0 > \sqrt{c_s^2 + c_A^2}$, i.e., when the star velocity exceeds the phase velocity of the fast magnetoacoustic wave. The most effective excitation mechanism of these waves is the stellar corpuscular winds arising from the multitude of dissipated stellar atmospheres. The gravitational excitation mechanism is much less effective. The magnitude of the magnetoacoustic radiation is tentatively estimated, subject to a possible later revision for a more accurate value of the mass loss factor M. "In conclusion, I would like to thank V. L. Ginzburg, S. A. Kaplan and S. B. Pikel'ner for their helpful comments."

ACCESSION NR: AP4017610

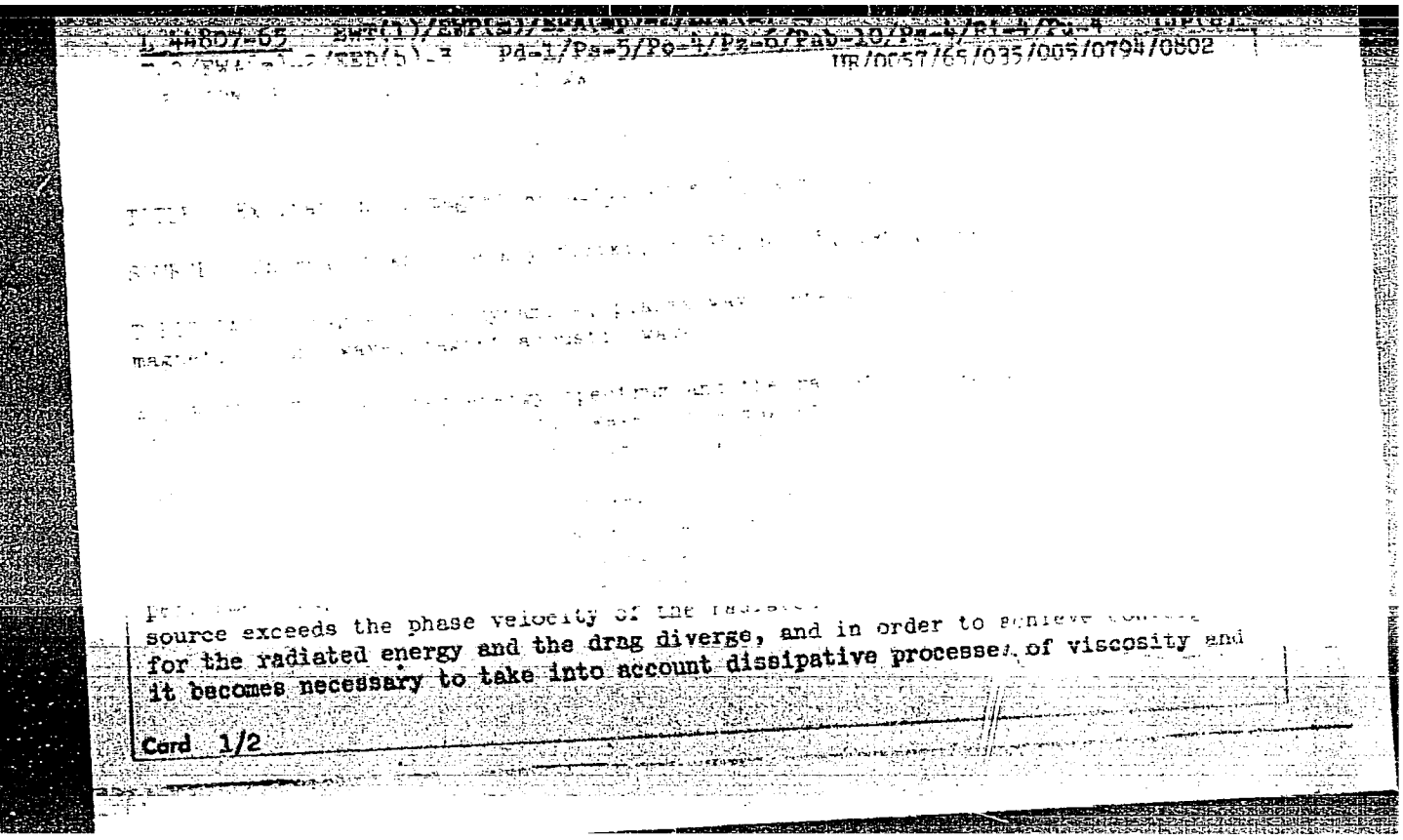
Orig. art. has: 59 formulas.

ASSOCIATION: RADIOFIZICHESKIY INSTITUT GOR'KOVSKOGO GOSUDARSTVENNOGO UNIVERSITETA (Radiophysics Institute, Gor'ki State University)

SUBMITTED: 05Apr63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: AA NO REF SOV: 011 OTHER: 011

Card 2/2



source exceeds the phase velocity of the
for the radiated energy and the drag diverge, and in order to
it becomes necessary to take into account dissipative processes of viscosity and

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L 44807-65

ACCESSION NR: AP5012042

elect r

revolution. Integral equations are derived for the radiated energy

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L 39455-65

Card 2/2

L 12068-66 EWT(1)/EWT(m)/EWP(w)/EPF(n)-2/EWP(v)/T-2/EWP(k)/ETC(m) IJP(c)
ACC NR: AP5021479 WW/EM/RB SOURCE CODE: UR/0046/65/011/003/0324/0333

AUTHOR: Dokuchayev, V. P.

ORG: Scientific Research Radiophysics Institute at the Gor'kiy State University (N.-i. radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete)

TITLE: Emission of sound waves by a body moving in a circle and by a rotating vane of arbitrary shape

SOURCE: Akusticheskiy zhurnal, v. 11, no. 3, 1965, 324-333

TOPIC TAGS: sound wave, acoustic field, propeller blade

ABSTRACT: It is pointed out in the introduction that in spite of the importance of sound waves produced by airplane and marine propellers, problems such as the angular distribution of the radiation intensity, the total radiated energy, or the energy spectrum still remain unclear. The author therefore considers the relatively simple problem of emission of sound waves from a body which moves uniformly in a circle whose radius is much larger than the dimensions of the body. The results of this problem are then generalized to include a system of bodies rotating along the circle and forming a vane of simple shape, such as a system

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ACC NR: AP5021479

consisting of several spheres or discs which are rigidly connected by thin horizontal rods of equal length and are secured to a uniformly rotating vertical shaft. The method of solution of the problem is based on introducing into Euler's equation the source strength function, such as used earlier by the author in an analysis of the emission of Mach waves by bodies moving with supersonic velocity (ZhETF v. 43, 595, 1962). Expressions are obtained for the acoustic fields in the wave zone for the distribution of the radiation intensity over the angles, for the total radiation energy, and for the energy spectrum. The results are valid only for subsonic velocities. Orig. art. has: 1 figure and 50 formulas.

SUB CODE: 20,01/ SUBM DATE: 24Mar64/ NR REF SOV: 009/ OTH REF: 005

Card 2/2

ACC NR: AP7001993 SOURCE CODE: UR/0040/66/030/006/1006/1014

AUTHOR: Dokuchayev, V. P. (Gor'kiy)

ORG: Scientific Research Institute of Radiophysics, Gorkiy State University (Nauchno-issledovatel'skiy radiofizicheskiy institut tori Gor'kovskov gosuniversitete)

TITLE: On a linear theory of flow past bodies. The method of force sources

SOURCE: Prikladnaya matematika i mekhanika, v. 30, no. 6, 1966, 1006-1014

TOPIC TAGS: subsonic aerodynamics, supersonic aerodynamics, viscous flow, incompressible fluid, compressible fluid, perturbation, pressure distribution, sound wave, drag coefficient

ABSTRACT:

A mathematical procedure called by the author the method of force sources for solving linear problems of interaction between solid bodies and liquids and gases is outlined. This method is based on the introduction of the function of the force sources of perturbations in the equation of motion of the fluid. Boundary conditions on the body surface make it possible to reduce the problem of determining the hydrodynamic forces to the solution of an integral equation for the force sources function. The source of perturbations is presented in the form of volume density of forces exerted on a gas by moving bodies. The distribution of surface

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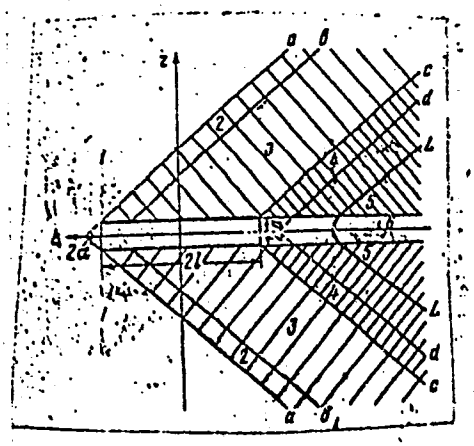

Fig. 1. Flow pattern.

stress is selected so that the corresponding boundary conditions on the surface are satisfied. This method is said to be analogus to the well known method of sources and sinks with the difference that this method leads to an integral equation describing directly the distribution of mechanical forces on the body surface. The method is illustrated by solving the three following simple problems related to acoustic, viscous, and compressible flows over bodies: 1) the emission of sound waves by a plate subjected to harmonic oscillations with frequency ω_0 and amplitude along the z-axis normal to the plate; 2) viscous incompressible fluid flow past a circular cylinder of infinite length, rotating with angular velocity around the z-axis; and 3) perturbations generated in a compressible fluid by three-dimensional force source of simplest shape. Pressure distributions on a cylinder at $M < 1$ or $M \gg 1$ are determined, and various regions of perturbations are outlined (see Fig. 1). An interpetation of the dependence between the drag coefficient on the Mach number is presented, and a calculation of the energy of

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ACC NR: AP7001993

emission of sound waves by the force source at M > 1 is included. The author hopes that this method of force sources may be useful for obtaining both rigorous and approximate solutions of problems of mechanical solid bodies-fluid medium interactions. Orig. art. has: 3 figures and 39 formulas.

SUB CODE: 20/ SUBM DATE: 06Sep65/ ORIG REF: 011/ OTH REF: 006
ATD PRESS: 5111

Card 3/3

DOKUCHAYEV, V. V., Candidate Tech Sci (diss) -- "Computation of the depth of foundations in permafrost". Leningrad, 1959. 17 pp (Min Transportation USSR, Leningrad Order of Lenin Inst of Railroad Transport Egnineers im Acad V. N. Obraztsov), 150 copies (KL, No 24, 1959, 136)

DOKUCHAYEV, V.V.

Calculating the depth of building foundations in permafrost grounds. Trudy Gos.inst. po proek. mor. pro. i sudorem. pred. no.6:3-28 '59. (MIRA 14:3)
(Foundations) (Frozen ground)

DOKUCHAYEV, Vladimir Vladimirovich, kand. tekhn.nauk; SIPIDIN, V.P., kand. tekhn.nauk, nauchnyy red.; KOSTANDOV, A.I., red.izd-va; PUL'KINA, Ye.A., tekhn. red.

[Foundations and footings on permafrost] Osnovaniia i fundamenty na vechnomerzlykh gruntakh. Leningrad, Gosstroiizdat, 1963. 194 p. (MIRA 16:5)
(Foundations) (Frozen ground)

AM1035375 BOOK EXPLOITATION S/

Velli, YU. YA. (Candidate of Technical Sciences); Dokuchayev, V. V.; Fedorov, N. F. (Doctor of Technical Sciences)

Buildings and structures in the extreme North; a handbook (Zdaniya i sooruzheniya na Kraynem Severe; spravochnoye posobiye), Leningrad, Gosstroyizdat, 1963, 490 p. illus., biblio. Errata slip inserted. 5,000 copies printed. (At head of title: Lenmorniiproyekt).

TOPIC TAGS: civil engineering, construction, highway, permafrost, communication line, water plant

PURPOSE AND COVERAGE: The book presents handbook data necessary for planning, designing, and construction of communities, civil and industrial buildings and their structural elements in the northern regions of the country and also gives data for designing engineering links, highways, water plants, communication lines, and electrical transmission lines. The book contains the technical-economic indicators and handbook materials necessary to select design parameters. The book is intended for engineers-planners and construction workers.

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AM4035375

TABLE OF CONTENTS [abridged]:

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AM4035375

SUB CODE: ME SUBMITTED: 09Dec63 NR REF SOV: 056

OTHER: 000 DATE ACQ: 16Apr64

Card 3/3

MAZUROV, Grigoriy Petrovich; DOKUCHAYEV, V.V., kand. tekhn. nauk, nauchn. red.

[Physical and mechanical properties of frozen ground; methods of determining and employing them in calculations] Fiziko-mekhanicheskie svoistva merzlykh gruntov; metody opredeleniia i ispol'zovaniia v raschetakh. Leningrad, Stroiizdat, 1964. 164 p. (MIRA 17:12)

21(8)

AUTHORS: Dokuchayev, Ya. P., Osipov, I. S. SOV/89-6-1-13/33

TITLE: Determination of Specific α-Activity and the Half-Life of U^{233} (Opredeleniye udel'noy α-aktivnosti i perioda poluraspada U^{233})

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 1, pp 73-73 (USSR)

ABSTRACT: The specific activity of 5 uranium samples was determined. The isotope composition, which was measured mass-spectroscopically, fluctuated in the case of individual samples between

U^{232} $\sim 4.10^{-3}$ percentage by weight

U^{233} 93.28 up to 95.24 percentage by weight

U^{234} 2.25 up to 2.36 ($\pm$ 0.07) percentage by weight

U^{235} $<$ 0.1 percentage by weight

U^{238} 2.46 up to 4.38 ($\pm$ 0.07) percentage by weight.

A nitric acid solution is produced from each uranium sample. From each of these solutions 30 preparations having a diameter

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Determination of Specific α-Activity and the Half-Life of U^{233}

of 10 ± 0.5 mm was made. The basis material is not given. The preparations were measured by two pulse ionization chambers with a small solid angle. From the multiplicity of measurements it follows that the specific activity of 1 μg U^{233} corresponds to 20.950 ± 100 α-decays. To this specific α-activity there corresponds a half-life of $(16.26 \pm 0.08).10^4$ years. This result is in good agreement with the data given by references 1 and 2. There are 2 references.

SUBMITTED: September 20, 1958

Card 2/2

21(8)

AUTHOR: Dokuchayev, Ya. P.

TITLE: Determination of the Specific α-Activities of Pu^{239} and Pu^{240} (Opredeleniye udel'noy α-aktivnosti Pu^{239} i Pu^{240})

SOV/89-6-1-14/33

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 1, pp 74 - 74 (USSR)

ABSTRACT: The specific α-activity of Pu^{239} and Pu^{240} was determined from 12 plutonium samples the isotopic compositions of which were within the following limits:

Pu^{239} 91.26 to 99.11 percentage by weight

Pu^{240} (0.87±0.06) to (7.57±0.10) percentage by weight

Pu^{241} $(1.3\pm0.3).10^{-2}$ to (1.04±0.05) percentage by weight

Pu^{238} (1.62±0.10) to $(1.75\pm0.05).10^{-2}$ percentage by weight

Pu^{242} + Np^{237} 0.01 to 0.1 percentage by weight

A solution was produced from each of these samples. From each solution 25 preparations were produced by weighing. The activity of the preparations was determined by parallel measuring (after drying and hardening of the precipitation)

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in two ionization chambers with a small solid angle. Each preparation was measured for 90 minutes in each chamber. The specific activity of Pu^{239}+Pu^{240} was determined from the difference between the measured activity and the activity Pu^{238}+An^{241}+Pu^{241}.

1 μg Pu^{239} has 136,200±200 α-decays / min., which corresponds to a half life of 24,390±30 years.

1 μg Pu^{240} has 500,000±4,000 α-decays / min., which corresponds to a half-life of 6,620±50 years. The half-lives obtained agree well with the data given by references 4 and 5. There are 5 references.

SUBMITTED: September 20, 1958

Card 2/2

DOKUCHAYEV, Yuriy Aleksandrovich; TITOV, G.S., Geroy Sovetskogo Soyuza, letchik-kosmonavt SSSR, red.; BYKOV, V., red.; LESHCHINSKAYA, G., tekhn. red.

[Going to the stars] Idushchie k zvezdam. Moskva, Molodaia gvardiia, 1963. 106 p. (MIRA 16:5)

1.Spetsial'nyy korrespondent agentstva pechati "Novosti" (for Dokuchayev).

(Astronauts)

DOKUCHAYEV, Yuriy

Going to the stars. Starsh.-serzh. no.9:4-5 S '62. (MIRA 15:11)
(Astronautics)

DOKUCHAYEVA, A. P. (MECH ENGR)

DOKUCHAYEVA, A. P. (MECH ENGR) -- "TECHNOLOGICAL PROBLEMS OF TRACTOR FLO[illegible]ING." SUB 28 MAR 52, MOSCOW INST OF MECHANIZATION AND ELECTRIFICATION OF AGRICULTURE IMENI V. M. MOLOTOV (DISSERTATION FOR THE DEGREE OF CANDIDATE IN TECHNICAL SCIENCES)

SO: VECHERNAYA MOSKVA, JANUARY-DECEMBER 1952

SVIRSHCHEVSKIY, Bronislav Stanislavovich; ABRIKOV, M.S., red.; ANTONOVSKIY, B.N., red.; BRONYAKOVA, A.V., red.; GLAZKO, V.G., red.; GOROBETS, P.Z., red.; DOKUCHAYEVA, A.P., red.; YELENEV, A.V., red.; KISELEV, I.I., red.; KOGANOV, A.B., red.; KONDRAT'YEV, M.A., red.; KONYUSHKO, V.A., red.; KURGANOV, A.I., red.; PUTYATIN, M.D., red.; FERE, N.E., red.; LEYTNEV, B.Ya., red.; MAKHOVA, N.N., tekhn. red.; GOR'KOVA, Z.D., tekhn. red.

[Utilization of tractors and machinery] Ekspluatatsiia mashinno-traktornogo parka. Izd.3., perer. Moskva, Gos. izd-vo sel'khoz. lit-ry, 1958. 660 p. (MIRA 11:10)

(Agricultural machinery)

DOKUCHAYEVA, A.P

DOLZHENKOV, Andrey Timofeyevich, dotsent, kand.tekhn.nauk; ANDREYEV, Nikolay Nikolayevich, dotsent; DOKUCHAYEVA, Avgusta Paramonovna, dotsent; KOZLOV, Ivan Pavlovich, starshiy prepodavatel'; KISELEV, Ivan Ivanovich, dotsent; PARAMZIN, Ivan Ivanovich, dotsent; TROFIMOV, Vladimir Ivanovich, dotsent; BEREZOVSKAYA, A.L., red.; KRYUKOV, V.L., red.; RAKOV, S.I., tekhn.red.

[Reference manual for young agricultural machinery operators] Spravochnik molodogo mekhanizatora sel'skogo khoziaistva. Moskva, Vses. uchebno-pedagog.izd-vo Trudrezervizdat, 1959. 694 p. (MIRA 12:12)

1. Prepodavateli Moskovskogo instituta mekhanizatsii i elektrifikatsii sel'skogo khozyaystva (for Dolzhenkov, Andreyev, Dokuchayeva, Kozlov, Kiselev, Paramzin, Trofimov).
(Agricultural machinery--Maintenance and repair)

DOKUCHAYEVA, A.P., dotsent

Effect of the condition of plowshares on the quality and economic aspects of plowing. Trudy MIMESKH 6:179-188 '59. (MIRA 14:5)
(Plows)

ANDREYEV, N.N., dots.; ACHKASOV, K.A., st. prepodavatel'; DOLZHENKOV, A.T., dots.; DOKUCHAYEVA, A.P., dots.; KISELEV, I.I., dots.; KOZLOV, I.P., st. prepodavatel'; TROFIMOV, V.I., dots.; PESTRYAKOV, A.I., nauchnyy red.; SHALYT, N.A., red.; TOKER, A.M., tekhn. red.

[Manual for the young agricultural machinery operator] Spravochnik molodogo mekhanizatora sel'skogo khoziaistva. Pod red. A.T.Dolzhenkova. Izd.2., ispr. i dop. Moskva, Proftekhizdat, 1963. 653 p. (MIRA 16:6)

1. Fakul'tet mekhanizatsii Moskovskoy akademii im. K.A. Timiryazeva (for all except Pestryakov, Shalyt, Toker).
(Agricultural machinery)

DOKUCHAYEVA, Avgusta Paramonovna, kand. tekhn. nauk; GLAZUNOVA, N.I., red.; NAZAROVA, A.S., tekhn. red.

[High production use of machines and tractors] Vysokoproizvoditel'noe ispol'zovanie mashinno-traktornogo parka. Moskva, Izd-vo "Znanie," 1961. 38 p. (Narodnyi universitet kul'tury: Sel'sko-khoziaistvennyi fakul'tet, no.18) (MIRA15:3)
(Agricultural machinery--Production standards)
(Tractors--Production standards)

STARUN, V.R.; DUDAVSKIY, I.Ye.; DAVYDOV, I.P.; KOLESNIK, M.I.; RYAZANTSEV, V.D.; SAMOYLOV, I.G.; DOKUCHAYEVA, I.N.

Dressing chrome iron ores from the Kimpersaiski deposits by magnetic separation. Ogneuproy 25 no. 3:108-114 '60. (13:10)

1. Zaporozhskiy ogneupornyy zavod (for Starun, Dudavskiy, Davydov, Kolesnik, Ryazantsev). 2. Institut "Mekhanobrchermet" (for Samoylov, Dokuchayeva).
(Ore dressing) (Magnetic separation of ores)

DOKUCHAYEVA, M. P.

PHASE I BOOK EXPLOITATION SOV/4984

International symposium on macromolecular chemistry. Moscow, 1960.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii SSSR, Moskva, 14-18 iyunya 1960 g.; doklady i avtoreferaty. Sektsiya III. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18, 1960; Papers and Summaries) Section III. [Moscow, Izd-vo AN SSSR, 1960] 469 p. 55,000 copies printed.

Tech. Ed.: P. S. Kashina.

Sponsoring Agency: The International Union of Pure and Applied Chemistry. Commission on Macromolecular Chemistry.

PURPOSE: This book is intended for chemists interested in polymerization reactions and the synthesis of high molecular compounds.

COVERAGE: This is Section III of a multivolume work containing papers on macromolecular chemistry. The articles in general deal with the kinetics of polymerization reactions, the synthesis of special-purpose polymers, e.g., ion exchange resins, semiconductor materials, etc., methods of catalyzing polymerization reactions, properties and chemical interactions of high molecular materials, and the effects of various factors on polymerization and the degradation of high molecular compounds. No personalities are mentioned. References given follow the articles.

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RAKHMANOV, Kh.D.; DOKUCHAYEVA, N.F.

A large aneurysm of the descending aorta simulating a hydated cyst of the left lung. Khirurgiia no.12:66-67 D' 55. (MLRA 9:7)

1. Iz kliniki fakul'tetskoy khirurgii (zav.-prof. G.M.Mints) Samarkandskogo meditsinskogo instituta.

(AORTIC ANEURYSM, differ. diag.
echinococcosis of lung)
(LUNGS, dis.
echinococcosis, differ. diag. from aortic aneurysm)
(ECHINOCOCCOSIS
lung, differ. diag. from aortic aneurysm)

Dokuchayeva, N.F.

RAKHMANOV, Kh.D. (Uzb.SSR., Samarkand, ul. Kzyl-Davat, d.6); DOKUCHAYEVA, N.F.

Multiple cartilaginous exostosis. Vest.khir. 77 no.9:120-122 S '56.
(MLRA 9:11)

1. Iz fakul'tetskoy khirurgicheskoy kliniki (i.o.zav. - dots. V.F. Medvedkov) Samarkandskogo meditsinskogo instituta im. I.P.Pavlova.

(EXOSTOSIS, MULTIPLE, case reports
cartilaginous,)

DOKUCHAYEVA, N. F. Cand Med Sci -- (diss) "X-Ray Picture of the Osseous System in the case of [redacted] Heat Burns. (Clinical-X-Ray Parallels)." Samarkand, 1957. 20 pp 22 cm. (Samarkand State Medical Inst im Academician I. P. Pavlov), 200 copies (KL, 28-57, 111-112)

DOKUCHAYEVA, N.F., kand. med. nauk; SHAKIROV, M.Sh., kand. med. nauk

Data of X-ray investigations following neurotomy of irradiated animals. Nauch. trudy SamMI 22:49-57 '63. (MIRA 17:9)

1. Iz kafedry fakul'tetskoy khirurgii i kafedry rentgenologii i meditsinskoy radiologii Samarkandskogo meditsinskogo instituta.

RAKHMANOV, Kh.D., dotsent; DOKUCHAYEVA, N.F., kand.med.nauk

Anomaly of the urinary tract simulating acute appendicitis.
Vest.khir. no.1:134-136'63. (MIRA 16:7)

1. Iz kliniki fakul'tetskoy khirurgii (zav.-prof. F.M. Goluh) i kafedry rentgenologii i radiologii (zav.-dotsent G.S.Kuznetsov) Samarkandskogo meditsinskogo instituta imeni akademika I.P.Pavlova (rektor - dotsent M.N.Khaitov).
(URINARY ORGANS— ABNORMITIES AND DEFORMITIES)
(APPENDICITIS)

DOKUCHAYEV, O. D.

USSR/Astronomy - Nebulae May/Jun 49

"Integral Photographic Astral Dimensions of Certain Planetary Mists," L. N. Radlova, O. V. Kats, O. D. Dokuchayev; State Astr Inst imeni P. K. Shternberg, 1½ pp

"Astron Zhur" Vol XXVI, No 3

Discusses southern planetary mists photographed in 1947 by L. N. Radlova and O. V. Kats at Abastuman Astrophys Obs. Photographing was done with an 8-inch camera (one meter length) and a Schmidt nonaberration camera (D-36 cm, F-62 cm). Gives table of names of mists, their coordinates for the year 1900, angular diameters, etc.

58/49T4

DOKUCHAYEVA, O. D.

PA 234T56

USSR/Astronomy - Absorption Coefficient   Sep/Oct 52

"Problem of Reality of Stellar Model With Constant Coefficients of Absorption," A. G. Masevich, O. D. Dokuchayeva, State Astr Inst imeni Shternberg

"Astron Zhur" Vol 29, No 5, pp 526-531

Analyzes mass-luminosity-radius relations by various scientists. Concludes that a model of a purely scattering star does not correspond to reality even in the case of highest tolerances in chem compn. Absorption by electrons in stars of hydrogen and helium will always play an important role, making the discussed model unreal. A model with const absorption coeff may be considered only as a theoretical limiting case.

234T56

DOKUCHAYEVA, O. D.

Mass of Orion nebula, Astron. tsir., No 122, 1952.

DOKUCHAYEVA, O.D.

PA 246T43

USSR/Astronomy - Diffuse Nebula Jan/Feb 53

"Determination of Mass of the Diffuse Nebula of Orion," O.D. Dokuchayeva, State Astron Inst imeni Shternberg

"Astron Zhur" Vol 30, No 1, pp 76-79

States results of mass determination of Orion nebula using V. A. Ambartsumyan's method (Uchebnik Teoreticheskoy Astrofiziki, 1939). Work is performed according to project of State Astron Inst imeni Shternberg. Obtains for mass of nebula around 166 times mass of Sun. Indebted to Prof B.A. Vorontsov-Vel'yaminov. Received 9 Apr 52.

246T43

DOKUCHAYEVA, O. D.

"Study of Characteristics of B Type Stars With Emission Lines in the Spectrum." Cand Phys-Math Sci, Moscow State U; State Astronomical Inst imeni Shternberg, Moscow, 1954. (RZhAstr, Nov 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (11)

SO: Sum. No.521, 2 Jun 55

VORONTSOV-VEL'YAMINOV, B.A.; DOKUCHAYEVA, O.D.; YEFREMOV, Yu.I.; KOZARENKO, B.I.; KARIMOVA, D.K.; KOSTYAKOVA, Ye.B.; LOZINSKIY, A.M.; MANOVA, G.A.; TSITSIN, F.A.; SHAROV, A.S.

Observations of Arend-Roland's comet (1956 h). Astron.tsir. no.180:2-4 My '57. (MIRA 13:4)

1. Gosudarstvennyy astronomicheskiy institut im. P.K.Shternberga, Moskva.
(Comets--1956)

DOKUCHAYEVA, O.D.

The final luminosity curve of DN Geminorum. Per.zvezdy 12 no.5:358-363 N '58. (MIRA 13:9)

1. Gosudarstvennyy astromonicheskiy institut im.Shternberga.
(Stars, New)

DOKUCHAYEVA, O.D.

Determining the spectrophotometric temperature and the Balmer serie decrement of AG Pegasi (1952). Per.zvezdy 12 no.5:372-373 N '58. (MIRA 13:9)

1. Gosudarstvennyy astronomicheskiy institut im. Shternberga, Moskva.
(Stars, Variable)

DOKUCHAYEVA, O.D.

KULAGIN, S.G.; KOVBASYUK, L.D.; DAGAYEV, M.M.; ROZENBLYUM, N.D.; YEGORCHENKO, I.F.(Irkutsk); KAVERIN, A.A. (Irkutsk); KONSTANTINOVA, T.G. (Irkutsk); KUKLINA, V.A. (Irkutsk); KUKLIN, G.V. (Irkutsk); SAZONOVA, Z.G., (Irkutsk); CHERNYKH, L.I. (Irkutsk); CHERNYKH, N.S. (Irkutsk); DEMIDOBICH, Ye.G.; BRONSHTEN, V.A.; YAKHONTOVA, N.S. (Leningrad); PEROVA, N.B.; DOKUCHAYEVA, O.D.; KATASEV, L.A.; KLYAKOTKO, M.A.; PARENAGO, P.P.; SHCHERBINA-SAMOYLOVA, I.S.; MASEVICH, A.G.; RYABOV, Yu.A.; SHCHEGLOV, V.P.; PEREL', Yu.G.; MARTYNOV, D.Ya.; FEDYNSKIY, V.V.; VORONTSOV-VEL'YAMINOV, B.A.; ZIGEL', F.Yu.; BAKULIN, P.I., otv.red.; RAKHLIN, I.Ye., red.; AKHLAMOV, S.N., tekhn.red.

[Astronomical calendar] Astronomicheskii kalendar'. [A yearbook; variable section for 1959] Ezhegodnik. Peremennaia chast', 1959. Red.kollegiia P.I. Bakulin i dr. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1958. 370 p. (Vsesoiuznoe astronomo-geodezicheskoe obshchestvo, no.62) (MIRA 12:2)

1. Gosudarstvennoye astronomo-geodezicheskoye obshchestvo (for Kulagin, Kovbasyuk, Demidovich). 2. Moskovskoye otdeleniye Vsesoyuznogo astronomo-geodezicheskogo obshchestva (for Dagayev, Rozenblyum, Bronshten, Perova).

(Astronomy--Yearbooks)

DoKuCHAYEVA, O.D.
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PHASE I BOOK EXPLOITATION SOV/3651

Vsesoyuznoye astronomo-geodezicheskoye obshchestvo

Astronomicheskiy kalendar' 1960 (Astronomical Calendar, 1960) Moscow, Fizmatgiz, 1959. 351 p. (Series: Its: Yezhegodnik; peremennaya chast', vyp. 63) 7,200 copies printed.

Ed.: I.Ye. Rakhlin; Tech. Ed.: S.N. Akhlamov; Editorial Board: P.I. Bakulin (Resp. Ed.), M.M. Dagayev, S.G. Kulagin, A.G. Masevich, P.P. Parenago.

PURPOSE: The book is intended for astronomers and geophysicists and physicists interested in astronomical phenomena.

COVERAGE: This yearbook on astronomy was compiled by a number of Soviet scientists specializing in several different branches of astronomy. The following persons participated in the work: L.D. Kovbasyuk, who wrote the chapters on ephemerides of the Sun and Moon; M.M. Dagayev, the chapters on planets, eclipses, physical coordinates of the Sun, Moon, Mars, and Jupiter, and the satellites of Jupiter and Saturn; V.S. Lazarevskiy, the chapters on ephemerides and heliocentric longitudes of planets; Ye.G. Demidov, the chapters on occultation of stars and planets by the Moon, observations of Polaris and computation of coor-

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dinates of stars; V.A. Bronshten, the chapters on comets; N.S. Yakhontova, sections on minor planets; and N.B. Perova, the chapters on variable stars. The appendixes contain articles on recent developments and events in astronomy such as the launching of the first Soviet space rocket, the 10th Congress of the International Astronomical Association held in Moscow in August 1958, developments in astronomy in 1958 during the IGY. There are 385 references, all Soviet.

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Astronomical Calendar, 1960 SOV/3651

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Astronomical Calendar, 1960 SOV/3651

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3(1) SOV/33-36-3-10/29

AUTHOR: Dokuchayeva, O. D.

TITLE: Determination of the Mass of the Orion Nebula From Photographs in the Red Light

PERIODICAL: Astronomicheskiy zhurnal, 1959, Vol 36, Nr 3, pp 461-467 (USSR)

ABSTRACT: The paper contains an estimation of the radiation $E_{n\lambda}$ of the Orion nebula in H_α in ergs/cm^2 sec in a unit solid angle. Four photographs of the nebula (with red filter) were used which were taken by the author in 1954 in GAISh with a 25-cm telescope and by G.A.Manova in 1955 in the Astrophysical Observatory AS Kaz. SSR with a 50-cm telescope. The calculations are carried out for the concentric domains of the nebula (extent: $55'_\square$, $260'_\square$, and $430'_\square$). The $E_{n\lambda}$-values averaged over the whole measured surfaces are: $2 \cdot 23 \cdot 10^{-2}$, $2 \cdot 26 \cdot 10^{-3}$, $5 \cdot 06 \cdot 10^{-3}$ ergs/cm^2 sec. The mass $\mathfrak{M}$ and the mean electron densities n_1 were calculated under the following assumptions : a) the nebula is spherical, b) the nebula is flat. For a): $n_1 = 1 \cdot 3 \cdot 10^3$, $4 \cdot 7 \cdot 10^2$, $3 \cdot 7 \cdot 10^2$; masses = 16, 57, 96 in solar unities. In the case b) the masses are 1.5-2 times smaller. The results show a good agreement with the data

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Determination of the Mass of the Orion Nebula From Photographs in the Red Light SOV/33-36-3-10/29

of other observers. The author mentions G.A.Shayn, V.F.Gaze, V.A.Ambartsumyan, P.P.Parenago, S.B.Pikel'ner, A.A.Nikitin. The author thanks Professor B.A.Vorontsov-Vel'yaminov, Academician V.G.Fesenkov, D.A.Rozhkovskiy, and Z.V.Koryagina.
There are 16 references, 10 of which are Soviet, 1 English, 1 French, and 4 American.

ASSOCIATION: Gosudarstvennyy astronomicheskiy institut imeni P.K.Shternberga (State Astronomical Institute imeni P.K.Shternberg)

SUBMITTED: June 17, 1958

Card 2/2

DOKUCHAYEVA, O.D.

A presumed variable star in the Pleiades. Astron.tsir. no.200:13 Mr '59. (MIRA 13:2)

1. Gosudarstvennyy astronomicheskiy institut im. P.K. Shternberga, Moskva.
(Stars, Variable)