The integrals in (6) are approximated by the stationary-phase method and an approximate expression is derived. This approximate expression is then compared with one obtained by introducing the concept of the surface impedance and is found to agree with the approximate expression obtained from the exact solution. This affords the possibility of evaluating the range of applicability of the surface-impedance approach. These reduce to the form

$$|\varepsilon'_{2m}| = \left|\frac{\varepsilon'_2}{\varepsilon'_1}\right| \gg 1, \quad |\varepsilon'_{3m}| = \left|\frac{\varepsilon'_3}{\varepsilon'_1}\right| \gg 1, \quad |k_1 l| < |\sqrt{\varepsilon'_{2m}}|, \quad |\delta^2(k_1)| < 1, \tag{13}$$

where the first two equations are customary in the theory of radiowave propagation, the third can be rewritten in the form where d_c is the skin-effect layer for the second medium, and the fourth is investigated by numerical analysis of several hypothetical paths.

There are eleven figures and ten references, as well as one table. The latest English-languages references are those by J. R. Wait (Geophysics, 18, 1953; IRE Trans. AP-1, 153, 9; AP-2, 1954, 144; J. Res. NBS 56, 1956, 232 and 59, 1957, 365.

TSVETKOV, Ye.I.; NOVIKOV, V.V.

Over-all mechanization of the cold-stamping shops. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i tekh.inform. 16 no.6: 24-27 '63. (MIRA 16:8)

(Forging machinery)

S/109/63/008/002/023/028
D266/D308

AUTHOR: Novikov, V.V.

TITLE: Solution of the problem of propagation of pulsed electromagnetic signals over a plane uniform Earth

PERIODICAL: Radiotekhnika i elektronika, v. 8, no. 2, 1963, 342-343

TEXT: The purpose of the paper is to shown that the formulas derived for the nonstationary field of a dipole in earlier papers (Vestn. Leningr. Un-ta, Ser. Fiziki i khimii, 1960, vyp. 2, no. 10, 16 and, with G.I. Makarov, Radiotekhnika i elektronika, 1961, v. 4, no. 5, 728) can be derived in the same form without the need to resort to approximations. The nonstationary field is expressed with the aid of the following integral

$$\int_{\tilde{L}} \frac{pu(p)u'(p)}{u(p) - a} e^{-2\frac{\zeta}{\beta}f(p)} dp, \qquad (1)$$

Card 1/2

Solution of the problem ...

where $u(p) = p(\sqrt{1 - p^2} - ip)$ $(\mathrm{Re}\sqrt{1 - p^2} \geqslant 0;$

$f(p) = p^2 + i\tau u(p);$

$\tau = \beta t';$ $\beta = \frac{(\varepsilon_m + 1)c}{r};$ $a = \frac{\omega_o}{2\zeta};$

$\zeta = \frac{\sigma}{\varepsilon_o(\varepsilon_m+1)};$ $t' = t - \frac{r}{c}$

This integral was previously solved by the method of steepest descent assuming that $2\zeta/\beta \gg 1$. Taking the same integration path and introducing the transformation

$$y = \sqrt{f(p) - f(p_o)}$$

(where $f(p_o)$ is the value of the $f(p)$ function at the sadde point p_o) the integral can be obtained in a closed form which turns out to be identical to that obtained in the references quoted. There is 1 figure.

SUBMITTED: April 10, 1962

Card 2/2

ACCESSION NR: AP4037460 S/0146/64/007/002/0014/0019

AUTHOR: Novikov, V. V.

TITLE: Investigation of inertia and sensitivity of a drift phototransistor

SOURCE: IVUZ. Priborostroyeniye, v. 7, no. 2, 1964, 14-19

TOPIC TAGS: phototransistor, phototransistor inertia, phototransistor sensitivity, drift phototransistor

ABSTRACT: As the specific shape and presence of field make alloy-phototransistor formulas inapplicable to a drift phototransistor, the steady-state and transient processes in the latter are analyzed and new formulas developed. A 5–10-μ electron base on a p-Ge crystal was obtained by diffusion of Sb from the vapor phase, while the emitter junction was prepared by the alloying method. An experimental verification of the formulas included determining the relationship between the drop time of the load-resistance curves and 1) the collector current and 2) the illumination wavelength used (0.5–2μ). The inertia and sensi-

Card 1/2

ACCESSION NR: AP4037460

tivity of a phototransistor with a base twice as large were also measured. If a higher speed of operation is desired, increasing the base width, while preserving a strong base field, is recommended. Orig. art. has: 4 figures and 16 formulas.

ASSOCIATION: none

SUBMITTED: 05Oct63 ATD PRESS: 3072 ENCL: 00

SUB CODE: EC NO REF SOV: 007 OTHER: 002

Card 2/2

NOVIKOV, V.V.

Investigating the sluggishness and sensitivity of a drift photodiode. Izv.vys.ucheb.zav.; prib. 7 no.2:14-19 '64.
(MIRA 18:4)

1. Rekomendovana kafedroy radiotekhniki Leningradskogo instituta tochnoy mekhaniki i optiki.

RAVICH-SHCHERBO, M.I.; NOVIKOV, V.V.

Role of insulin in the biosynthesis of antibodies. Probl. endok. i gorm. 10 no.6:92-97 N-D '64. (MIRA 18:7)

1. Kafedra biokhimii (zav. - prof. M.I.Ravich-Shcherbo) Kurskogo meditsinskogo instituta.

DEVYATKOV, Aleksandr Nikitovich; NOVIKOV, Vladimir Vasil'yevich;
GEDEVANOV, A.K., inzh., retsenzent;

[The GPS-70 loading machine] Pogruzochnaia mashina GPS-70.
Moskva, Izd-vo "Nedra," 1964. 66 p. (MIRA 17:5)

ACCESSION NR: AP4031093 S/0187/64/000/004/0054/0057

AUTHOR: Novikov, V. V.

TITLE: Experimental investigation of sluggishness and sensitivity of a drift phototransistor

SOURCE: Tekhnika kino i televideniya, no. 4, 1964, 54-57

TOPIC TAGS: phototransistor, drift phototransistor, drift phototransistor sluggishness, drift phototransistor sensitivity, semiconductor device, transistor

ABSTRACT: The sensitivity and sluggishness of a p-Ge phototransistor with a common-emitter current gain of 100-200 were measured. A sensitivity of 2-7 amp/lum is reported. The sluggishness was determined from the collector-current transients transpiring in a common-emitter circuit. The experimental curves presented in the article show that: (a) the phototransistor sluggishness depends on the collector voltage approximately as $t \approx U_k^{-\frac{1}{4}}$; (b) the sluggishness

Card 1/2

ACCESSION NR: AP4031093

also depends on the load resistance; (c) the collector-current drooping is 4-6 times longer under illumination-excitation conditions than under electric-excitation conditions, other things being equal. It is believed that the sluggishness is determined by these factors: (a) collector-to-base diffusion of light-generated minor carriers; (b) relaxation of the charge in the base region under the emitter; (c) charge-exchange of the barrier capacitance of the collector junction. In order to reduce the sluggishness of the phototransistor, the selection of a wider base is recommended. Orig. art. has: 7 figures and 2 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: GE NO REF SOV: 007 OTHER: 001

Card 2/2

ACC NR: AT6026767 SOURCE CODE: UR/2754/66/000/005/0051/0061

AUTHOR: Makarov, G. I.; Novikov, V. V.

ORG: none

TITLE: Certain properties of normal waves in the problem of the propagation of radio waves in the earth-ionosphere waveguide channel

SOURCE: Leningrad. Universitet. Problemy difraktsii i rasprostraneniya voln, no. 5, 1966. Rasprostraneniye radiovoln (Radio wave propagation), no. 4, 51-61

TOPIC TAGS: radio wave propagation, ionospheric propagation, ionospheric radio wave, waveguide

ABSTRACT: The purpose of the investigation was to clarify complications that result from the curvature of the earth, the curvature of the ionosphere, or that involve the determination of the boundary between the two. It is assumed that such a boundary is flat. Three models are considered: one is flat and two are spherical. One of the spherical models is the Grinberg model with an interphase boundary possessing dielectric penetrability. Comparing these models, the authors arrive at the following conclusions: Assuming the frequency remains the same, the phase velocity is larger in the Grinberg model than in the flat one. Both exceed the velocity of light at all but 0 frequencies. Phase velocities are the same for the flat model and along the axis of

Card 1/2

ACC NR: AT6026767

the other spherical model. However, the phase velocity is smaller along the surface of the spherical model. For low altitudes, the field has the aspect of a heterogenous wave and increases exponentially with altitude, which is taken perpendicularly to the surface of the sphere. In the case of the flat model, the field decreases as the altitude increases. At high altitudes, the field oscillates with the height in both models. Orig. art. has: 2 figures, 38 formulas.

SUB CODE: 09,17/ SUBM DATE: none/ ORIG REF: 002

Card 2/2

25(1) SOV/19-59-5-278/308

AUTHOR: Novikov, V.V.

TITLE: A Lens Processing Machine

PERIODICAL: Byulleten' izobreteniy, 1959, Nr 5, pp 61-62 (USSR)

ABSTRACT: Class 67a, 19. Nr. 118456 (602727 of 27 June 1958). The machine has an instrument mechanically rocked in the meridional plane of the rotating lens. To produce dome-shaped elliptical lenses with different values of the semiaxes of the elliptical generatrix, the rocking mechanism is made in the form of rockers, placed on the two opposite sides of the rotating lens, each separated according to the length of the connecting rod carrying the instrument into parts equal to the a/m semiaxes and which move along two mutually perpendicular guides when their ends rock.

Card 1/1

SOV/19-58-6-618/685

AUTHORS: Novikov, V.V., and Bersenev, Ye.I.

TITLE: An Optical Lighting Device (Svetoopticheskoye ustroystvo)

PERIODICAL: Byullten' izobreteniy, 1958, Nr 6, p 136 (USSR)

ABSTRACT: Class 74d, 8$_{10}$. Nr 113813 (580624 of 15 July 1957). Submitted to the Committee for Inventions and Discoveries at the Ministers Council of USSR. A device consisting of a belt lens with an annular tubular gas lamp and a toroidal reflector mounted inside. The annular focal line of the belt lens, the center annual line of the toroidal reflector and the annular axis line of the lamp are brought into one annular line to obtain even lighting within the whole horizon with a simultaneous increase of illuminations in an axial direction.

Card 1/1

EWT(m)/FA/EWP(h) KSD(t)/AFTC(a)

ACCESSION NR: AP4047094 S/0286/64/000/018/0103/0103

AUTHORS: Novikov, V. V.; Kovalev, V. I.; Chernigovskiy, M. N.

TITLE: Apparatus for the experimental study of aircraft visibility in projector beams and the testing of projector equipment. Class 72f, No. 69660

SOURCE: Byul. izobr. i tovar. znakov, no. 18, 1964, 103

TOPIC TAGS: aircraft, projector, aircraft identification

ABSTRACT: This Author Certificate presents an apparatus for the experimental study of aircraft visibility in projector beams and the testing of projector equipment. The apparatus casts an episcope projector image of the aircraft model on a screen illuminated from the observer's side by an illuminator for background simulation. The background is created by the projector beams in order to approximate natural

L 10827-65
ACCESSION NR: AP4047094

mechanism, is used to simulate conditions of observing a moving aircraft in the projector beam with the beams casting an image of the aircraft model on the screen.

ASSOCIATION: none

SUBMITTED: 03Jan45 ENCL: 00

SUB CODE: AC, DC NO REF SOV: 000 OTHER: 000

Card 2/2

NOVIKOV, Vitaliy Vasil'yevich

SMO

At a ceremony in the Kremlin 21 June 56, awards were presented to the associates of the Institute of the Inst. Precision Mechanics and Computer Engineering, Dept. Mys-Math Scts, AS USSR, for "special distinction in the creation and operation of the high-speed electronic computer BESM." Ukase No 270 of the Presidium of Supreme Soviet SSSR, published in the 13 Jun 1956 (sic) issue of Vedomosti Verkhovnogo Soveta SSSR lists the following award:

NOVIKOV, Vitaliy Vasil'yevich -- senior technician.

Order of Lenin
Order Labor Red Banner
Order Badge of Honor

SO: CIA, FDD Sum 1003, 20 July 56, Confidential. sib

ALTAYEV, Sh.A.; MUKUSHEV, M.N.; SMIRNOV, A.I.; POPOV, Yu.G.; NOVIKOV, V.Ye.

Analysis of coal losses in Karaganda Basin mines and ways of curtailing them. Nauch. trudy KNIUI no.14:50-62 '64. (MIRA 18:4)

ALTAYEV, Sh.A.; MUKUSHEV, M.M.; SULEYEV, E.A.; NOVIKOV, V.Ya.; GUL'NEV, G.L.

Using glass reinforced plastic in Karaganda Basin mines. Nauch. trudy KNIUI no.14:162-164 '64. (MIRA 18:4)

NEKRASOV, O.A., kand.tekhn.nauk; NOVIKOV, V.Ye., inzh.

Results of the traction and power tests of the experimental VL80 electric locomotive. Trudy TSNII MPS no.286:5-34 '65. (MIRA 18:8)

LIVSHITS, B.G.; NOVIKOV, V.Yu.; TOLSTOVA, T.Yu.

Determining the surface energy of grains in transformer steel of various purity. Fiz. met. i metalloved. 18 no.4:580-583 O '64. (MIRA 18:4)

1. Moskovskiy institut stali i splavov.

NOVIKOV, V.Yu., referent.

Trends in the development of high speed steel in the United States (from "Industrieblatt" no.6, 1957). Metalloved. i obr. met. no.5: 52-53 My '58. (MIRA 11:5)

(United States--Tool steel)

- LIVSHITS, B.G.; NOVIKOV, V.Yu.

Studying the kinetics of secondary recrystallization in transformer steel. Fiz.met.i metalloved. 15 no.3:458-561 Mr '63. (MIRA 16:4)

1. Moskovskiy institut stali i splavov.
(Steel—Metallography) (Crystallization)

LIVSHITS, B.G.; NOVIKOV, V.Yu.

Origin of secondary recrystallization nuclei in transformer stee. Fiz. met. i metalloved. 16 no.6:862-866 '63. (MIRA 17:2)

1. Moskovskiy institut stali i splavov.

18.3200

75947
SOV/133-59-10-8/39

AUTHORS: Novikov, Ya. A., Sudoplatov, L. V., Berkovich, G. Ya.

TITLE: Application of Natural Gas in Open-Hearth Furnaces

PERIODICAL: Stal', 1959, Nr 10, pp 897-898 (USSR)

ABSTRACT: The plant (not named) tested the following methods of using natural gas in an open-hearth furnace: (1) partial replacement of coke oven gas by natural gas; (2) complete replacement, i.e., firing by natural gas with mazut addition; and (3) addition of natural cold gas into the port end to intensify the process. It was found that open-hearth furnaces work (1) on coke oven-natural gas mixture with a high methane content without adverse effects on performance figures; (2) on natural-blast furnace gas mixture without coke oven gas. Emissive properties of flame improved slightly, melting period decreased, and productivity was somewhat raised. The authors conclude that,

Card 1/2

NOVIKOV, Ya.A., kandidat tekhnicheskikh nauk.

Prestressed reinforced concrete elements. Biul.strei.tekh.9 no.2:31-32 Ja '52. (MLRA 9:4)

1.TSentral'nyy institut informatsii po streitel'stvu.
(Prestressed concrete construction)

NOVIKOV, YA. A.

PA 228T79

USSR/Engineering - Construction, Bridges

15 Jun 52

"Construction of Bridges Out of Prestressed Reinforced Concrete," Ya. G. Galkin, Ya. A. Novikov, Candidates Tech Sci

"Myul Stroit Tekh" No 12, pp 16-19

Briefly reviews recent application of method and describes construction of railroad overpass on motor highway, using prestressed concrete. Span of overpass was composed of 2 sectional cantilever reinforced-concrete I-beams each 28 m long. Suggests some measures for further improvement in respect to steel conservation.

228T79

NOVIKOV, Ya.A., kandidat tekhnicheskikh nauk; SHATSKIY, Ye.Z., kandidat tekhnicheskikh nauk, redaktor; ROSTOVTSEVA, M.P., redaktor; MEDVEDEV, L.Ya., tekhnicheskiy redaktor.

[From the work practice in using prefabricated reinforced concrete in industrial and housing construction] Iz opyta primeneniia sbornogo zhelezobetona v promyshlenom i grashdanskom stroitel'stve. Moskva, Gos. izd-vo lit-ry po stroit. i arkhitekture, 1956. 58 p. (MLRA 9:6)

1.Moscow. TSentral'nyy institut informatsii po stroitel'stvu.
(Precast concrete)

NOVIKOV, Ya.A., kandidat tekhnicheskikh nauk.

Modern plants manufacturing reinforced concrete elements. Opyt stroi. no.1:4-17 '56. (MLRA 10:4)
(Concrete plants)
(Precast concrete)

NOVIKOV, Ya.A., kandidat tekhnicheskikh nauk.

Methods for stressing and anchoring reinforcements in bent prestressed reinforced concrete construction elements. Opyt stroi. no.3:53-60 '56. (MLRA 10:4)
(Reinforced concrete)

NOVIKOV, Ya.A., kandidat tekhnicheskikh nauk.

Prestressed reinforced concrete bridges. Opyt stroi. no.6:72-96 '56.
(Bridges, Concrete) (Prestressed concrete) (MLRA 10:4)

NOVIKOV, Ya.A., kandidat tekhnicheskikh nauk.

Practice abroad in building bridges using prestressed reinforced concrete. Biul.stroi.tekh. 13 no.1:34-37 Ja '56. (MLRA 9:5)

1. TSIITS.
(Germany, West--Bridges, Concrete)

NOVIKOV, Ya.A., kandidat tekhnicheskikh nauk.

Concrete frame elements with subsequent stressing of reinforcements. Biul. stroi.tekh. 13 no.12:31-34 D '56. (MLRA 10:2)

1. TsINIS AS1A SSSR.
(Prestressed concrete)

NOVIKOV, Ya.A., dots. kand.tekhn.nauk

Optimum percentages for reinforcing reinforced concrete structural components. Sbor. trud. MISI no.11:44-68 '57. (MIRA 11:3)
(Reinforced concrete)

NOVIKOV, Ya.A., kand. tekhn. nauk

Examples of structural details in buildings used for light industry. Opyt strei. no.33:81-96 '61. (MIRA 16:8)

NOVIKOV, Ya.A., kand.tekhn.nauk

Examples of design details of industrial enterprises of the food industry. Opyt stroi no.35:73-86 '61. (MIRA 15:7)
(Industrial buildings)

SOKOLOV, Ye.Ya., prof.; NOVIKOV, Ya.B., inzh.

Concerning the methodology for accounting for the technological and economic indices of thermal electric power plants. Elek. sta. 32 no.12:76-78 D '61. (MIRA 15:1)
(Heating from central stations) (Electric power plants)

NOVIKOV, Ya.B., inzh.

Are heat supplying turbines with heat throw-off necessary?
Teploenergetika 10 no.7:95-96 Jl '63. (MIRA 16:7)

(Electric power plants) (Turbines)

NOVIKOV, Ya.B., inzh.

Some additional factors on the effectiveness of heating from central stations. Teploenergetika 11 no.3:91 Mr '64. (MIRA 17:6)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

20

CA

Hydroinsulating material. Ya. M. [illegible], E. E. Yudovich, and A. Ya. [illegible]. U.S.S.R. [illegible], Oct. 31, 1946. For water-proofing (foundations, walls, etc.) is used a thin Al sheet coated on both sides with a bituminous compn. In order to impart to the Al sheet the required pliability, the sheet is heat-treated for 2-6 hrs. at 250-400° followed by slow cooling; finally the Al sheet is drawn through the bituminous compn. at 180° and then cooled slowly.

M. Hosch

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

NOVIKOV, YA. N.

NOVIKOV, YA. N. - inzh. 1, YUDOVICH, E. Z. - laureaty stalinskoy premii kand. tekhn. nauk.

Nauchno-issledovatel'skiy institut zheleznodorozhnogo stroitel'stva i proyektirovaniya
VODONEPRONITSAYEMYY TSEMENT I YEGO FIZIKO-KHIMICHESKIYE SVOYSTVA Page 110

SO: Collection of Annotationsof Scientific Research Work on Construction, completed in 1950, Moscow, 1951

IVANOV, F.M., kand.tekhn.nauk; GLADKOV, A.A., kand.tekhn.nauk; NOVIKOV, Ya.N., inzh.

Waterproofing culverts on railroad lines. Transp. stroi. 10 no.10: 53-54 O '60. (MIRA 13:10)
(Culverts)

IVANOV, F.M., inzh.; KUTSENKO, V.N., inzh.; NOVIKOV, Ya.N., inzh.;
SHKLOVSKIY, M.Ya., inzh.

Use of polyvinyl chloride plastics for the waterproofing of bridges.
Transp.stroi. 11 no.3:23-24 Mr '61. (MIRA 14:3)
(Waterproofing) (Bridge construction) (Ethylene)

IVANOV, F.M.; NOVIKOV, Ya.N.

Gluing concrete and reinforced concrete articles with epoxy resins.
Avt. dor. 24 no.3:22-23 Mr '61. (MIRA 14:5)
(Concrete) (Epoxy resins)

NOVIKOV, Ya.N.; GAYVAN, V.V.; IVANOV, F.M.

Improved waterproofing of overpasses. Avt.dor. 25 no.8:20-21 Ag '62. (MIRA 16:2)
(Viaducts)

NOVIKOV, Ya.S., kapitan 1-go ranga

Statistical data about foreign submarines during the Second World War period. Mor. sbor. 46 no.5:[illegible] '63. (MIRA 17:1)

NOVIKOV, Ye., inzh.

Cart for removing engines from the PAZ-652 motorbuses. Avt. transp. 42 no. 5:22-23 My '64. (MIRA 17:5)

NOVIKOV, Ye.

Typical conveyers for fur cap production. Leg.prom. 14 no.10:55 O '54. (MLRA 7:11)

(Fur) (Conveying machinery)

23577

S/042/61/016/002/003/005
C 111/ C 222

16.4900

AUTHOR: Novikov, Ya.

TITLE: Solution to certain equations with variational derivatives

PERIODICAL: Uspekhi matematicheskikh nauk, v. 16, no. 2, 1961, 135-141

TEXT: The variational derivative of the functional $\Phi\{\varphi\}$ is defined as in the paper of E. Hopf (Statistical hydromechanics and functional calcus, Journ. Rat. Mech. Anal. 1 (1952), 87) and is denoted with

$$F\{\varphi, x\} = \frac{\partial \Phi\{\varphi\}}{\partial \varphi\, dx} \quad (2) \ .$$

For variational derivatives of higher order the notations

$$\frac{\partial^k \Phi\{\varphi\}}{(\partial \varphi\, dx)^k} \equiv \Phi^{(k)}\{\varphi\} \ , \quad \frac{\partial^k \Phi\{\varphi\}}{\partial \varphi dx_1 \ldots \partial \varphi dx_k} \equiv \Phi^{(k)}\{\varphi\} \quad (3)$$

are used. A functional $f(x; x_1, \ldots, x_n)$ which satisfies

Card 1/7

Solution to certain equations ...

is called a generator of the function $\lambda(x)$, in symbols ${}_n[\lambda(x)]$ or briefly $[\lambda]$. The expression

$$(\psi, \varphi)_n \equiv \int_n \cdots \int \psi(x; x_1, \ldots, x_n)\varphi(x_1)]\cdots\varphi(x_n)] \, dx_1 \cdots dx_n, \quad (5)$$

where every integral is extended on the region of definition of φ is called the n-fold projection of ψ onto ψ... In agreement with the definition of the variational derivative it holds

$$\frac{\partial (\psi, \varphi)_n}{\partial \varphi \, dy} = \sum_{k=1}^{n} \int_{n-1} \cdots \int \psi(x; x_1, \ldots, x_{k-1}, y, x_{k+1}, \ldots, x_n) \times$$

$$\times \varphi(x_1)\cdots\varphi(x_{k-1})\varphi(x_{k+1})\cdots\varphi(x_n)dx_1 \cdots dx_{k-1}dx_{k+1}\cdots dx_n. \quad (7)$$

The author considers the equation

$$\Phi^{(n)}\{\varphi\} = f_n(x) \quad (8)$$

Card 2/7

Solution to certain equations ...

Its solution which corresponds to the boundary conditions

$$\Phi^{(k)}\{0\} = f_k(x) \qquad (k=0,\ldots,\ n-1) \tag{9}$$

reads

$$\Phi\{\varphi\} = \sum_{k=0}^{n''} \frac{1}{k!} (_k[f_k], \varphi)_k \tag{10}$$

and is not unique. If it is demanded that

$$\frac{\partial \Phi\{\varphi\}}{\partial x} = 0 \tag{11}$$

is valid and that the variational derivatives in (8) and (9) are taken in different points then the solution of

$$\Phi^{(n)}\{\varphi\} = g_n(x_1,\ldots,\ x_n) \tag{8'}$$

$$\Phi^{(k)}\{0\} = g_k(x_1,\ldots,\ x_k) \qquad (k=0,\ldots,\ n-1;\ g_0 = \text{const}) \tag{9'}$$

Card 3/7

Solution to certain equations ...

is unique and is given by

$$\Phi\{\psi\} = \sum_{k=0}^{n} \frac{1}{k!} (g_k, \psi)_k \qquad (10')$$

The author considers the equation

$$L\Phi = 0 \qquad (12)$$

where

$$L = L_0 + \sum_{s=1}^{n} L_{ss} \frac{\partial}{\partial \varphi\, dx} L_{s,s-1} \cdots \frac{\partial}{\partial \varphi\, dx} L_{s0} \; ; \qquad (13)$$

and L_0, L_{sp} are arbitrary integro-differential operators not depending on φ. The general solution of (12) reads

Card 4/7

Solution to certain equations ...

$$\Phi\{\varphi\} = \sum_{k=1}^{n} c_k e^{(\lambda_k, \varphi)} \quad , \qquad (16)$$

where the λ_k are (different) roots of

$$L_0 1 + \sum_{s=1}^{n} L_{ss} \lambda L_{s,s-1} \lambda \ldots \lambda L_{s0} 1 \equiv \tilde{L}\lambda = 0 \qquad (15)$$

and the c_k can be obtained from n conditions for $\Phi\{\varphi\}$ and its first (n-1) variational derivatives. If the λ_k have the multiplicities s_k then instead of (16) we have

$$\Phi\{\varphi\} = \sum_{k} \sum_{i=0}^{s_k - 1} (A_{ki}, \varphi)_i \, e^{(\lambda_k, \varphi)} \quad . \qquad (19)$$

The author considers the problem

$$\frac{\partial \Phi[\varphi, \psi]}{\partial \varphi \, dx} = k(x) \frac{\partial^2 \Phi[\varphi, \psi]}{(\partial \varphi \, dx)^2} \quad (k(x) > 0) \qquad (25)$$

Card 5/7

Solution to certain equations ...

$$\Phi\{0;\psi\} = \delta((\lambda,\psi)) \qquad (26)$$

where $\delta(x)$ -- Dirac function.

For $(\lambda,\psi) \to \pm\infty$ $(\varphi \geq 0)$ it holds $\Phi\{\varphi;\psi\} \to 0$. (27)

The solution is sought with the arrangement

$$\Phi\{\varphi;\psi\} = f(z,\tau) \qquad (28)$$

where

$$z = (\mu,\psi),\ \tau = (\nu,\psi). \qquad (29)$$

Herefrom it follows

$$\Phi\{\varphi;\psi\} = \frac{1}{2\sqrt{\pi(k\lambda^2,\psi)}} \cdot e^{-\frac{(\lambda,\psi)^2}{4(k\lambda^2,\psi)}}. \qquad (32)$$

Card 6/7

In the appendix (52) is obtained in another manner.

The author thanks A. S. Monin for advices. There is 1 non-Soviet-bloc reference. The reference to the English-language publication reads as follows: E. Hopf, Statistical hydromechanics and functional calculus, Journ. Rat. Mech. Anal. 1 (1952), 87.

SUBMITTED: May 22, 1959

SHVARTSBERG, S., inzh.; NOVIKOV, Ye., inzh.; SKVARCHEVSKIY, I.; KORNEV, M.; CHEBOTAYEV, A., inzh.

Exchange of experience. Avt.transp. 42 no.1:48-50 Ja '64. (MIRA 17:2)

BESPALOV, P., inzh.; ZAV'YALOV, S., inzh.; NOVIKOV, Ye., inzh.; TELESHEV, A., inzh.

Equipment for washing and drying motorbuses and motortrucks. Avt. transp. 43 no.6:16-18 Je '65. (MIRA 18:6)

NOVIKOV, YE. A.

USSR/Metals - Cast Iron, Casting, Methods — Oct 51

"Casting Containers for Annealing Malleable Iron," Ye. A. Novikov, Engr, Pervomaysk Plant, Osipenko

"Litey Proizvod" No 10, p 12

Pots for annealing malleable iron castings were cast in sand, having 30-40 mm thickness of walls. For metal conservation, centrifugal casting method was adopted. Wall thickness was decreased to 12-15 mm. Describes centrifugal casting machine and casting procedure. Dimensions of pots: Outside diam 600 mm, height - 450 mm.

190T66

NOVIKOV, YE. A.

Steel Castings

Welded steel mold boxes with iron handles. Sel'khozmashina no. 3, 1952

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

NOVIKOV, Ye.A.

Acute mental disorders in influenza. Zhur. nevr. i psikh 59 no.3: 265-267 '59. (MIRA 12:4)

1. Kafedra psikhiatrii (nachal8nik - prof. A.S. Chistovich) Voyenno-meditsinskoy akademii imeni S.M. Kirova.

(INFLUENZA, compl.
ment. disord. (Rus))
(MENTAL DISORDERS, etiol. & pathogen.
influence (Rus))

NOVIKOV, YE. A.

AUTHOR: Novikov, Ye. A. 49-4-22/23

TITLE: On simulating on models the steady state fall of particles inside a medium. (O modelirovanii ustanovivshegosya padeniya chastits v srede).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1957, No.4, pp. 556-557 (USSR)

ABSTRACT: In measuring the speed of fall in model tests, the Reynolds number is frequently used as a basis of analogy. In this brief communication it is proposed to use another analogy parameter which contains solely known values. In addition, use of this parameter permits writing, in a universal form, an equation expressing the dependence of the steady state speed of fall of particles on the dimensions. The analogy parameter is the value γ which is expressed by the magnitudes d, ρ, ρ', ν, g (d - particle diameter, ρ and ν - density and kinematic viscosity of the medium, ρ' - density of the particles, g - gravity acceleration).

Card 1/1 There is one figure.

SUBMITTED: October 9, 1956.

ASSOCIATION: Ac.Sc. U.S.S.R. Institute of Applied Geophysics. (Akademiya Nauk SSSR Institut Prikladnoy Geofiziki).

AVAILABLE: Library of Congress.

NOVIKOV, Ye.A.

Deposition of aerosol particles from their flow unto obstacles.
Izv.AN SSSR.Ser.geofiz. no.8:1034-1044 Ag '57. (MIRA 10:8)

1.Akademiya nauk SSSR, Institut prikladnoy geofiziki.
(Aerosols)

AUTHOR: Novikov, Ye.A. (Moscow) SOV/40-22-3-19/21

TITLE: On Turbulent Diffusion in a Flow With Transverse Velocity Gradients (O turbulentnoy diffuzii v potoke s poperechnym gradiyentom skorosti)

PERIODICAL: Prikladnaya matematika i mekhanika, 1958, Vol 22, Nr 3, pp 412 - 414 (USSR)

ABSTRACT: The author considers the diffusion of a medium discharging from a point source into the neighbouring gas, whereby he assumes that the gas flows vertically to the discharge direction and that it varies according to a linear velocity law in the discharge direction. The influence of this velocity gradient is investigated. A general formula for the concentration of the admixed medium in the flowing medium is derived from which the following facts can be taken:
1. The coefficient of the turbulent diffusion in general can be neglected after a certain time after the beginning of the flowing out.
2. After this time the concentration of the admixed medium changes in the center of the diffusion cloud according to a time law of the form : $t^{-5/2}$. For a flow without velocity

Card 1/ 2

On Turbulent Diffusion in a Flow With Transverse Velocity Gradients

SOV/40-22-3-19/21

gradient, however, the concentration changes with $t^{-3/2}$ only.
3. The lines of equal concentration are ellipses which are strongly drawn apart in the direction of the flow. The ratio of the horizontal axis of the ellipse to the vertical one is proportional to the time for sufficiently great times. Therefore the longly drawn diffusion clouds of admixtures frequently observed can be essentially explained by the existence of a velocity gradient. Only if the flowing medium possesses a constant velocity, then this appearance can be explained by the assumption of different diffusion coefficients in directions vertical to each other.
There is 1 Soviet reference.

SUBMITTED: August 14, 1957

Card 2/2

SOV/49-59-11-27/28

AUTHOR: Novikov, Ye. A.

TITLE: On the Question of Forecasting the Synoptic Processes

PERIODICAL: Izvestiya Akademii nauk, Seriya geofizicheskaya, 1959, Nr 11, pp 1721-1724 (USSR)

ABSTRACT: The author introduces a correction to Thomson's paper on this subject presented during the 11th General Assembly of IGY (Ref 2). The term, including the Coriolis force, is excluded and the random error $R_0(x, y)$ is introduced to Thomson's Eq (1). Thus the "error margin" R, Eq (2) is obtained where Ψ - solution of Eq (1) for the original data

$$\phi(x, y, 0) = \Psi_0(x, y).$$

This correction is applied to Thomson's derivations (Eq (3) to (11)) and its application is given in an example (Eqs (I) to (XIII)). Thanks are conveyed to A. S. Monin for guidance. There are 2 Soviet references.

ASSOCIATION: Akademiya nauk SSSR, Institut prikladnoy geofiziki (Academy of Sciences USSR, Institute of Applied Geophysics)

SUBMITTED: November 21, 1958

Card 1/1

29507
S/049/60/000/011/009/012
D247/D305

9,9100 (1046)

AUTHOR: Novikov, Ye. A.

TITLE: On magneto-hydrodynamics of the ionosphere

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya geofizicheskaya, no. 11, 1960, 1624-1634

TEXT: Equations are derived for magneto-hydrodynamic phenomena in the ionosphere, taking into account the anisotropy of conductivity. Electromagnetic fields, currents, polarized charges, electromagnetic forces and electromagnetic dissipation of energy connected with turbulent movements of gases in the ionosphere are investigated in spectral forms. Effective coefficients of conductivity (which characterize the turbulent flow of an anisotropically conducting gas) are introduced. An estimation is given of the influence of the earth's magnetic field on the turbulent movements of gases in different layers of the ionosphere. The ionosphere is a partly ionized gas possessing anisotropic conductivity in geomagnetic fields. By movements of gases, electromagnetic fields, currents and polarized

Card 1/4

On magneto-hydrodynamics...

charges are originated which can affect considerably the corresponding movements. After a detailed analysis of the phenomena, the author derives several equations which, together with the equation of state $p = R\rho T$, form a closed system, characterizing hydrodynamics in the electric field potential φ. If v and φ are known, one can compute E, ρ_e and j. The fluctuations of the magnetic field are determined when j is known. The following qualitative conclusions can be drawn: (1) The magnetic field, the current density and the electromagnetic force are of the same order of magnitude as the velocity; (2) The magnetic field is of a higher order of magnitude; (3) The polarized charge is of a lower order (the same as the rotor of velocity); (4) Electromagnetic dissipation of energy, in contrast to viscous dissipation, is of the order of magnitude of the basic movement. The author investigates the turbulent "electromagnetic noise" which under certain circumstances can affect the movement of the medium. The values of the volume-charge and the density of turbulent currents are deduced from experimental data.

IX

Card 2/4

On magneto-hydrodynamics...

$$Q \approx 1.5 \cdot 10^{-14} \text{ CGSE} \quad , \quad \sqrt{\overline{\rho_e^2}} \approx 2 \cdot 10^{-14} \text{ CGSE/cm}^3$$

These values are comparable with the density of currents connected with tidal movements in the ionosphere and causing daily fluctuations of the geomagnetic field near the surface. However, turbulent currents do not produce considerable fluctuations of the geomagnetic field near the earth's surface. Owing to interference, a criterion for the effects of electromagnetic noise on the movements of gases is derived. The author considers that the effect of the noise can be neglected at an altitude of 100 km , but can be of importance at an altitude of 150 km . Above 250 km , the inertial forces cease to play any part, and ordinary phenomena of turbulency cannot arise. Incidental movements in the upper horizons of the atmosphere appear to have the character of vibrations. The author expresses his gratitude to A. S. Monin for discussion and remarks. There are 15 references: 8 Soviet-bloc and 7 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: J. S. Greenhow, E. L Neufeld, Measurements of turbulence in the upper atmosphere,

Card 3/4

29507
S/049/60/000/011/009/012
D247/D305

On magneto-hydrodynamics...

Proc, Phys. Soc., 74, P. 1, No. 475, 1959; J. S. Greenhow, E. L. Neufeld, Measurements of turbulence in 80 to 100 km regin from the radio-echo, J. Geophys. Res., 64, No. 12, 1959; M. Nicolet, Collision frequency of electrons in the terrestrial atmosphere, Phys. of Fluid, 2, No. 2, 1959; M. Nicolet, Constitution of the atmosphere at ionospheric levels, J. Geophys. Res., 64, No. 12, 1959.

ASSOCIATION: Akademiya nauk SSSR. Institut fiziki atmosfery (Academy of Sciences, USSR. Institute of Physics of the Atmosphere)

SUBMITTED: August 19, 1960

Card 4/4

NOVIKOV, Ye.A.

Energy spectrum of a turbulent flow of incompressible fluid. Dokl. AN SSSR 139 no.2:331-334 Jl '61. (MIRA 14:7)

1. Institut fiziki atmosfery AN SSSR. Predstavleno akademikom A.N. Kolmogorovym.
(Vortex motion) (Hydrodynamics) (Turbulence)

25711
S/020/61/139/003/013/025
B104/B201

9.9100

AUTHOR: Novikov, Ye. A.

TITLE: Electron density fluctuations in the ionosphere

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 3, 1961, 587-589

TEXT: A study has been made of the turbulent fluctuation of the electron density in the atmosphere to an altitude of about 110 km, up to which the collision frequency of ions with neutal particles is high compared with the Larmor frequency in the magnetic field of the Earth. The turbulent motion of the gas in the lower atmosphere can be regarded as being locally isotropic, as the magnetic field exerts no appreciable effect. The data supplied in Table 1 concerning the turbulence have been derived from data by J. S. Greenhow et al. (J. Geophys. Res., 64, no. 12, (1959)). It is shown here that the local isotropic turbulence produces, in the interval of dissipation, electron density fluctuations which are strongly elongated along the direction of the terrestrial magnetic field. The spectral distribution of electron density fluctuations in the interval of dissipation is expressed by the density of kinetic energy of the turbulent gas motion.

Card 1/54

Electron density fluctuations...

The possibility is thus given of experimentally studying the turbulence spectrum in the dissipation interval. Equation

$$\frac{\partial N}{\partial t} + (v\nabla)N - \gamma\Delta N = -\alpha_i \bar{N}(n \operatorname{rot} v) \qquad (1)$$

describes the change of electron density in the ionosphere (I. D. Howells, J. Fluid Mech., 8, part 4 (1960)). Here, N is the electron density, $\bar{N}$ is the mean electron density; $\vec{v}$ is the gas velocity; $\vec{n}$ is the unit vector of the terrestrial magnetic field; γ is the coefficient of ambipolar diffusion; ω_i and ν_i (ω_e and ν_e) are the Larmor frequency and the collision frequency of ions (electrons) with neutral particles. This equation is applicable by approximation at altitudes of 80 - 110 km. Two mechanisms are indicated to account for the formation of turbulent fluctuations of electron density in the ionosphere. One is related to the existence of a vertical gradient of the mean electron density and to turbulent mixing. The other is related to the terrestrial magnetic field. Equation (1)

Card 2/4

Electron density fluctuations...

yields

$$\Phi(p,\mu)=\frac{E(p)}{4\pi(\gamma-\nu)^2\beta^2}\left[(\bar{N})^2 f(\mu)+\frac{\chi_1}{2\gamma\beta^2}\right] \quad (p\lambda_0\gg 1;\ \gamma>\nu); \quad (2)$$

$$\chi_1=2\gamma\overline{(\Delta N_1)^2}; \quad f(\mu)\approx a_1^2(1-\mu^2) \quad (\alpha_1\ll 1\ll\alpha_2). \quad (3)$$

as a relation between the three-dimensional spectral function of electron density fluctuations $\Phi(p,\mu)$ and the spectral density of kinetic energy E(p). Here, p denotes the wave number; μ is the cosine of the angle between the direction of the wave vector and $\bar{n}$; $\bar{N}_1$ is the electron density fluctuation, related to $d\bar{N}/dz$; the formula for E(p) has been given in a previous paper (DAN, 139, no. 2, (1961)). The quantity χ_1 can be approximated with $\chi_1\approx 2hv_z(d\bar{N}/dz)^2$, where $h=RT/mg$; m is the molecular weight of the gas, g the terrestrial acceleration; v_z the root-mean square value of vertical turbulent velocity pulsations. As may be seen, the spectral function for $|\mu|\sim 1$ attains the lowest, and for $\mu\sim 0$ the highest value. This means that the electron density changes only slightly in the

Card 3/4

NOVIKOV, YE. A.

Dissertation defended at the Institute of Mechanics for the academic degree of Candidate of Physicomathematical Sciences:

"Hydromagnetic Turbulence in the Ionosphere."

Vestnik Akad Nauk, No. 4, 1963, pp. 119-145

ACCESSION NR: AP4015982 S/0040/63/027/005/0944/0946

AUTHOR: Novikov, Ye. A. (Moscow)

TITLE: Variability of energy dissipation in turbulent flow and energy distribution in the spectrum

SOURCE: Prikl. matem. i mekhan., v. 27, no. 5, 1963, 944-946

TOPIC TAGS: variability, energy dissipation, turbulent flow, kinetic energy, kinematic viscosity, Reynolds number, law of two thirds, spectral density, statistical averaging

ABSTRACT: One of the basic characteristics of turbulent flow is the dissipation of kinetic energy:

$$\varepsilon = 2\nu D_{ik}^2, \qquad D_{ik} = \frac{1}{2}\left(\frac{\partial v_i}{\partial x_k} + \frac{\partial v_k}{\partial x_i}\right) \qquad (1)$$

Here ν is the kinematic viscosity, v_i is the velocity field, D_{ik} is the tensor of deformation of a fluid particle. The variable ε, as well as the velocity,

Card 1/3

ACCESSION NR: AP4015982

depends in a random fashion on the coordinates and one time. A. N. Kolmogorov (Lokal'naya struktura turbulentnosti v neszhimayemoy zhidkosti pri ochen' bol'shikh chislakh Reynol'dsa. Dokl. AN SSSR, 1941, t. 30, No. 4) introduced two hypotheses of similarity relating to the structure of turbulent flow for large Reynolds numbers. By the first hypothesis, the structure of turbulent flow, in scales which are rather small compared to the characteristic exterior scale of turbulence L, is determined by two parameters: the mean energy dissipation $\langle \varepsilon \rangle$ and ν. According to the second hypothesis, in the so-called inertial interval of distances

$$L \gg r \gg l_0 \quad r^{2/3} \langle \varepsilon \rangle^{-1/3} \qquad (2)$$

(l_0 is the interior scale of turbulence), only the parameter $\langle \varepsilon \rangle$ remains essential. On the basis of the hypotheses of similarity a series of results is obtained, of which the most important is the "law of 2/3" of Kolmogorov-Obukhov, and its analog in spectral language -- the "law of 5/3"

$$E(p) = C \langle \varepsilon \rangle^{2/3} p^{-5/3} \quad (l_0^{-1} \gg p \gg L^{-1}) \qquad (3)$$

Here E(p) is the spectral density of the kinetic energy, p is the wave number and C is a constant. Soon after the appearance of the concept of similarity of turbulence the necessity of considering the changes in ε relative to large scale

Card 2/3

ACCESSION NR: AP4015982

motion, was demonstrated by L. D. Landau. Other authors refined the hypotheses with consideration of the statistical nature (variability) of energy dissipation of turbulent flow. In a slightly different way, the author makes use of the same idea of considering the variability of energy dissipation, which leads to the following, apparently paradoxical, conclusions:) similarity "deteriorates" with use of more minute scales; and b) the velocity field, which is rather smooth (in the sense of existence of higher derivatives) in different realizations, is aggravated after statistical averaging (mean-square values of sufficiently high derivatives tend to infinity). Orig. art. has: 13 formulas.

ASSOCIATION: none

SUBMITTED: 27May63 DATE ACQ: 21Nov63 ENCL: 00

SUB CODE: AI NO REF SOV: 005 OTHER: 004

Card 3/3

L 13814-63 EWT(d)/EWT(l)/FCC(w)/BDS AFFTC/ASD LJP(C)

ACCESSION NR: AP3003152 S/0056/63/044/006/2159/2168

55
53

AUTHOR: Novikov, Ye. A.

TITLE: Method of random forces in similarity theory 16

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 2159-2168

TOPIC TAGS: turbulence of fluid particles, single particle description, two particle description, random force method

ABSTRACT: A method is proposed for the statistical description of the motion of fluid particles in turbulent flow, based on the decay law for equilibrium velocity fluctuations and the associated Langevin stochastic equation. The decay law is generalized by taking into account the internal time scale of the fluctuations; this ensures the existence of finite accelerations. The correlations for periods that are small compared with the relaxation time of the fluid particles and for distances that are small compared with the mixing length are studied. Consideration of such time intervals and distances yields the correlation functions of the relative motion of fluid particle, which is a new result not derivable from similarity considerations alone. Coefficients relating the characteristics of single-particle and two-particle descriptions of

Card 1/2/ Association: Inst. of Physics of the Atmosphere

ACCESSION NR: AP4030342 S/0049/64/000/003/0408/0413

AUTHORS: Novikov, Ye. A.; Stewart, R. W.

TITLE: The intermittence of turbulence and the fluctuation spectrum of energy dissipation

SOURCE: AN SSSR. Izv. Ser. geofiz., no. 3, 1964, 408-413

TOPIC TAGS: turbulence, intermittent turbulence, energy, energy dissipation, energy spectrum, fluctuation spectrum, Gaussian distribution, velocity field, third moment, fourth moment

ABSTRACT: The authors undertook this study because of the lack of information on the higher moments (above the second) of the velocity field in the study of turbulent flow. They have proposed a model of intermittent turbulence based on the fact that at large Reynolds numbers energy dissipation is concentrated at rather small isolated regions in the current. Within the framework of this model, the authors have computed the fluctuation spectrum of energy dissipation. The result is in qualitative agreement with experimental data. If the fluctuation spectrum is computed as the spectrum of the fourth moment of the velocity field, on the basis of

Card 1/2

ACCESSION NR: AP4030342

M. D. Millionshchikov's work (K teorii odnorodnoy izotropnoy turbulentnosti. Izv. AN SSSR, ser. geogr. i geofiz., No. 4, 5,1942), then a positive exponent is obtained in the inertial interval of wave numbers. If the computations are based on S. Corrsin's view (Turbulent dissipation fluctuations. Phys. Fluids, 5, No. 10, 1962), that the dissipation is concentrated in thin layers within which the distribution probability is Gaussian, then the fluctuation spectrum exhibits a plateau-like form with a subsequent rise, in contradiction to experimental data. The authors thus conclude that the probability distribution for the velocity field in turbulent flow differs sharply from Gaussian, not only because the third moment differs from zero (because of transmission of energy between movements of different force) but also because of higher-order moments, in particular the fourth. Orig. art. has: 31 formulas.

ASSOCIATION: Akademiya nauk SSSR Institut fiziki atmosfery (Academy of Sciences SSSR Institute of Physics of the Atmosphere)

SUBMITTED: 29Jul63 DATE ACQ: 29Apr64 ENCL: 00

SUB CODE: AS NO REF SOV: 007 OTHER: 007

Card 2/2

ACCESSION NR: AP4030344 S/0049/64/000/003/0426/0429

AUTHOR: Novikov, Ye. A.

TITLE: The relative movement of liquid particles in turbulent flow

SOURCE: AN SSSR. Izv. Ser. geofiz., no. 3, 1964, 426-429

TOPIC TAGS: liquid, liquid particle, turbulent flow, correlation moment, Gaussian probability distribution, wave number

ABSTRACT: This is a continuation of the author's previous work (Metod sluchaynykh sil v teorii turbulentnosti. Zh. eksperim. i teoret. fiz., v. 44, no. 6, 1963), in which correlation moments of the second order were computed for a single liquid particle and for the movement relative to other particles. In the present work, computations of third moments are made for movement relative to other particles, and a procedure is proposed for computing correlation moments of a higher order for a system of any number of particles. In computing these moments above the third order, the author assumes that any random force acting on a fixed liquid particle (as a function of time) has a Gaussian probability distribution. He starts from a stochastic equation (taken from his previous work) for relative movement of

Card 1/2

ACCESSION NR: AP4030344

liquid particles in locally homogeneous and locally isotropic turbulent flow, and he derives expressions for higher moments. In the expression for the third moment, random forces are found to contribute nothing that arises as a consequence of local isotropy. The author notes that the influx of energy from the operation of random forces may be determined independently by measuring the mean square distance between particles or from the structural function of the velocity of one fixed particle. The dissipation of kinetic energy may be determined by measuring the energy spectrum of turbulent flow in the region of large wave numbers. Orig. art. has: 15 formulas.

ASSOCIATION: Akademiya nauk SSSR Institut fiziki atmosfery (Academy of Sciences SSSR, Institute of Physics of the Atmosphere)

SUBMITTED: 29Jul63 DATE ACQ: 29Apr64 ENCL: 00

SUB CODE: AS NO REF SOV: 006 OTHER: 002

Card 2/2

L 16307-65 EWT(l)/EWP(m)/EPF(n)-2/FCC/EWA(d) Pd-1./Pu-4 ESD(t)/AEDC(a)/AFWL/ ASD(f)-2/ASD(p)-3/AFETR WW/GW

ACCESSION NR: AP5000351 S/0056/64/047/005/1919/1926

AUTHOR: Novikov, Ye. A.

TITLE: Functionals and method of random forces in turbulence theory

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 5, 1964, 1919-1926

TOPIC TAGS: turbulence, Euler equation, random process, atmospheric turbulence, hydrodynamics, correlation function, similarity analysis

ABSTRACT: The author describes an Euler velocity field $v_i(x, t)$ using the method of random forces, proposed in his earlier papers (ZhETF v. 44, 2159, 1963; Izv. AN SSSR/seriya geofiz. No. 3, 1964) for a Lagrangian description of turbulence. A model is considered of a homogeneous isotropic and statistically stationary

Card 1/3

L 16387-65
ACCESSION NR: AP5000351

turbulent flow of a liquid whose kinetic energy is maintained by work done by external forces, which are also assumed to be homogeneous and isotropic random functions of the coordinates and statistically stationary in time. Generalizing the method of random forces by including the hydrodynamic equations, the author obtains an equation relating the structural velocity functions of second and third order, with the correlation function of the external forces. It follows from this equation, in particular, that at distances larger than the external correlation scale, the structural function of third order decreases like r^{-4}. An equation is also derived for the characteristic functional of the velocity, describing the equilibrium mode of the turbulent flow. In the limiting case, when the scale becomes infinite, this equation contains a single external parameter, namely the incoming energy, and this corresponds to the similarity hypothesis advanced by Kolmogorov (DAN SSSR v. 30, 299, 1941). Orig. art. has: 40 formulas.

Card 2/3

L 16387-65
ACCESSION NR: AP5000351

ASSOCIATION: Institut fiziki atmosfery* Akademii nauk SSSR
(Institute of Atmospheric Physics, Academy of Sciences SSSR)

SUBMITTED: 21May64 ENCL: 00

SUB CODE: ME NR REF SOV: 006 OTHER: 003

Card 3/3

L 3586-66 EWT(l)/EWP(m)/EWA(d)/ECS(k)/EWA(l)

ACCESSION NR: AP5021065 UR/0362/65/001/008/0788/0796
532.517.4

42
39
B

AUTHOR: Novikov, Ye. A.

TITLE: On high-order correlations in turbulent flow

SOURCE: AN SSSR. Izvestiya. Fizika atmosfery i okeana, v. 1, no. 8, 1965, 788-796

TOPIC TAGS: turbulent flow, fluid dynamics, Reynolds number, atmospherics, atmospheric turbulence

ABSTRACT: The hypotheses of quasi-normality and similarity as applied to the higher correlation moments of a turbulent velocity field are examined. Qualitative calculations of the fourth and sixth correlation moments for the square of the velocity gradient are made on the basis of an intermittency model developed earlier by Ye. A. Novikov and R. U. Styuart (Peremezhayemost' turbulentnosti i spektr fluktuatsiy dissipatsii energii. Izv. AN SSSR, ser. geofiz. No. 3, 1964). The preliminary results are compared with existing experimental data. It is found that the formula for the spectrum of the sixth moment

$$\varphi_6(p) \sim \langle \gamma \rangle^3 p^{-1+2\mu},$$

is in fairly good agreement with the results of experimental measurements by

Card 1/2

L 3586-66

ACCESSION NR: AP5021865

A. S. Gurvich and S. L. Zubkovskiy (Opredeleniye chetvertykh i shestykh korrelyatsionnykh momentov gradiyentov skorosti. Izv. AN SSSR, fizika atmosfery i okeana, 1, No. 8, 1965). It is decided that a satisfactory solution of the turbulence problem should be sought through a probability distribution of a new type that differs substantially from the Gaussian. A somewhat new direction for measurements is proposed, and formulas are derived that predict the possible results of these measurements. The author thanks A. S. Gurvich and S. L. Zubkovskiy for conducting the experimental study. Orig. art. has: 26 formulas and 1 table.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki atmosfery (Academy of Sciences, SSSR, Institute of Physics of the Atmosphere)

SUBMITTED: 05Feb65 ENCL: 00 SUB CODE: ME

NO REF SOV: 017 OTHER: 011

Card 2/2

L 20538-66 EWT(l)/EWP(m)/EWT(m)/EWA (d)/T/EWA(l)/EPF(n)-2 WW/DJ

ACC NR: AP6012068 (N) SOURCE CODE: UR/0362/65/001/009/0992/0993

55
B

AUTHOR: Novikov, Ye. A.

ORG: Institute of Atmospheric Physics, AN SSSR (Institut fiziki atmosfery AN SSSR)

TITLE: Pressure fluctuation spectrum in a turbulent flow

SOURCE: AN SSSR. Izvestiya. Fizika atmosfery i okeana, v. 1, no. 9, 1965, 992-993

TOPIC TAGS: incompressible fluid, fluid pressure, turbulent flow

ABSTRACT: In an incompressible fluid pressure is related to velocity by the relation

$$\Delta p = -\rho \frac{\partial u_\alpha}{\partial x_\beta} \frac{\partial u_\beta}{\partial x_\alpha}, \qquad (1)$$

where ρ is fluid density and u_α is the velocity field. A. M. Obukhov (Doklady AN SSSR, 66, No. 1, 1949) computed the structural function of pressure on the basis of the quasi-normalcy hypothesis. The spectral density of pressure corresponding to the structural function computed by Obukhov has the form

$$\varphi_p(k) \sim \rho^2 \langle \varepsilon \rangle^{4/3} k^{-7/3}. \qquad (2)$$

A similar result can be obtained from considerations of dimensionality if it is assumed that in the inertial interval of wave numbers the

Card 1/2 UDC: 551.551:532.517.4

L 20538-66

ACC NR: AP6012068

pressure spectrum is determined only by the one-dimensional parameter $\langle\varepsilon\rangle$. Recently doubt has arisen as to the correctness of both the quasi-normalcy hypothesis and the application of simple considerations of dimensionality to higher-order moments. This paper therefore discusses the applicability of a random function of a new type, an intermittent random function, to this problem. It is found that

$$\varphi_p(k) \sim \rho^2 \langle\varepsilon\rangle^2 \nu^{-2} k^{-5+\mu}, \quad 0 < \mu < 1 \qquad (3)$$

(with $\mu \approx 0.4$). The spectra (2) and (3), obtained on the basis of different assumptions, differ appreciably from one another. Further investigation is required. Orig. art. has: 6 formulas. [JPRS]

SUB CODE: 20 / SUBM DATE: 25Mar65 / ORIG REF: 007

Card 2/2

L 09373-67 EWT(d)/EWT(l)/EWP(m)/EWP(l) IJP(c)
ACC NR: AP6023201 SOURCE CODE: UR/0020/66/168/006/1279/1282

AUTHOR: Novikov, Ye. A. 62 B

ORG: Institute of Physics of the Atmosphere, Academy of Sciences, SSSR (Institut fiziki atmosfery Akademii nauk SSSR)

TITLE: Mathematical model of the alternability of a turbulent stream

SOURCE: AN SSSR. Doklady, v. 168, no. 6, 1966, 1279-1282

TOPIC TAGS: turbulent flow, Reynolds number, flow velocity, mathematic model, similarity theory

ABSTRACT: This is a continuation of earlier work (Izv. AN SSSR, ser. geofiz., no: 3, 1964), where the velocity field of turbulent flow was described in the form of alternations consisting of "pulses contained in pulses." The present article is devoted to construction of a mathematical model of this picture, wherein the alternability is characterized by the square of the velocity gradient. The region where the averaged value of this quantity assumes large values (corresponding to a large local Reynolds number), contains in turn subregions with even larger values, which stand out against the background of relatively quiet subregions. It is assumed that the regions with the large local Reynolds numbers satisfy certain similarity laws and their behavior can be traced down to scales in which the local Reynods numbers become of the order of unity. The remaining regions are considered as a background. The mathematical treatment consists in analyzing the statistical characteristics of $y_s(x)$, the square of the

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velocity gradient, distributed over a system of random points with a Poisson distribution. The spectral density of $y_s(x)$ is calculated and an asymptotic expression is obtained for it. It is shown that this spectrum agrees better with experiment than spectra proposed by others. The effect of viscosity on the spectrum is briefly discussed. This report was presented by Academician N. D. Millionshchikov 24 June 1965. Orig. art. has: 29 formulas.

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