MALOV, Vladimir Sergeyevich; ZHUKHOVITSKIY, B.Ya., red.

[Remote control] Telemekhanika. Izd.2., dop. i perer. Moskva, Energiia, 1965. 94 p. (Biblioteka po avtomatike, no.123) (MIRA 18:6)

ZHUKHOVITSKIY, Boris Yakovlevich; NEGNEVITSKIY, Iosif Borisovich;
POLIVANOV, K.M., prof., red.

[Theoretical principles of electrical engineering in three parts] Teoreticheskie osnovy elektrotekhniki v trekh chastiakh. Moskva, Energiia. Pt.2. 1965. 238 p.
(MIRA 19:1)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002064920004-4"

ZHUKOVITSKIY, I.M. (Belgorod, Kurskaya oblast')

Detection of cancer among patients with gastrointestinal diseases.
Klin. med. 32 no.8:37-42 Ag '54. (MLRA 7:10)
(GASTROINTESTINAL DISEASES, complications,
cancer, incidence)
(GASTROINTESTINAL SYSTEM, neoplasms,
incidence in other gastrointestinal dis.)

ZHUKOVITSKIY, I.M. (Belgorod)

Lung cancer & smoking; a survey of recent literature. Klin. med. 37 no.4:26-29 Ap '59. (MIRA 12:6)
(LUNG NEOPLASMS, etiol. & pathogen. smoking, review (Rus))
(SMOKING, inj. eff. cancer of lung, review (Rus))

Zhukovitskiy, I.M.

ZHUKOVITSKIY, I.M. (Belgorod)

[redacted] Lung cancer and its prevention. Fel'd. i akush. 23 no.2:20-25 F '58. (MIRA 11:3)

(LUNGS--CANCER)

ZHUKOVITSKIY, I.M. (Belgorod)

Surgery in diseases of the stomach. Fel'd. i akush. 23 no.9:3-7 S '58 (MIRA 11:10)

(STOMACH--SURGERY)

1. ZHUKOVITSKIY, I. M.

2. USSR (600)

4. Pharynx.- Tumors

7. Lympho-epithelioma. Fel'd. i akush. no. 11. '52.

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

ZHUKHOVITSKIY, L.

Beyond the Arctic Circle. NTO no.7:56-58 Jy '59. (MIRA 12:11)

1. Zamestitel' predsedatelya Noril'skogo pravleniya nauchno-tekhnicheskogo obshchestva tsvetnoy metallurgii.
(Noril'sk--Research, Industrial)

ZHUKHOVITSKIY, L. F. (Noril'sk Directorate)

"The Work of the Noril'sk Directorate of the Society.

report presented at the Fifth Full Assembly of the Central Admin. of the Non-Ferrous Metallurgical Sci.-Tech. Society, Moscow 21-22 Feb 58.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002064920004-4"

ZHUKHOVITSKIY, M. S.

[Work of nurses at the V.M.Molotov sanatorium for children afflicted with tuberculosis of the bone] Opyt raboty meditsinskikh sester detskogo kostnotuberkuleznogo sanatoriia imeni V.M.Molotova. Moskva, Medgiz, 1955. 86 p. (MLRA 9:4)
(BONES--TUBERCULOSIS) (PEDIATRIC NURSING)

RAPOPORT, Ya.L.(Moskva); ZHUKHOVITSKIY, M.S. (Moskva)

Pathology of calcinosis of the soft tissue. Arkh.pat. 18 no.5:74-77 '56. (MLRA 9:12)

(CALCINOSIS, pathology,
soft tissue calcinosis (Rus))

ZHUKHOVITSKIY, M.S., doktor med.nauk; KREYN, Z.E.; OSENNYAYA, A.A.

Training and treatment of children with sequelae of poliomyelitis under the conditions of special boarding schools. Pediatriia no.10:65-69 '61. (MIRA 14:9)

1. Iz Instituta po izucheniyu poliomiyelita Akademii meditsinskikh nauk (dir. - prof. M.P. Chumakov). (POLIOMYELITIS)

ZHUKHOVITSKIY, M.S.

Stimulating effect of aero- and heliotherapy on bony tissue regeneration. Vop.kur., fizioter.i lech.fiz.kul't. 28 no.1:10-14 '63. (MIRA 16:4)

(AEROTHERAPY) (SUN BATHS) (BONES—SURGERY)

L 22921-66 EWT(m)/EPF(n)-2/EWP(t)/EWA(h) DIAAP JD/WW/JG
SOURCE CODE: UR/0367/65/001/006/0941/0947

ACC NR: AP6014822

AUTHOR: Dzhelepov, B. S.; Zhukovskiy, N. N.--Zhukovsky, N. N.; Maloyan, A. G.--Malayan, A. G.

1/2
B

ORG: none

TITLE: Gamma-spectrum of Eu sup 152* with a 9.2-hour half-live 19

SOURCE: Yadernaya fizika, v. 1, no. 6, 1965, 941-947

TOPIC TAGS: europium, gamma spectrum, samarium, spectrometer

ABSTRACT: The relative intensities of 13 γ-lines from Eu^{152*} are determined with the aid of magnetic photoritron and elotron spectrometers (the error in the basic line intensities does not exceed 6%). Four new Eu^{152*} γ-lines which must be added to the decay scheme are found. A new excitation level with an energy of 1680 KEV is found in Sm^{152}. A deviation from the Alaga (sic) rules is noted when the 1511 KEV (1^-) level degenerates to the 2^+ or 0^+ rotation bands of the ground state. The authors thank Ye. A. Khol'novaya for the calorimetric measurements of the preparations Au^{198} and Sc^{46}; Yu. V. Knol'nov for making possible the research of gamma-spectrum Eu^{152*} on photoritron; E. A. Arutyunyan for help with the measurements and with the processing of the experiments on photoritron; A. G. Dmitriyev, V. F. Rodionov, and T. I. Sidorovaya for assistance in measuring the elotron. Orig. art. has: 6 figures and 1 table. [Based on authors' Eng. abst.] [JPRS]

SUB CODE: 20 / SUBM DATE: 31Nov64 / ORIG REF: 004 / OTH REF: 006

Card 1/1

2

L 9828-66 EWT(1)/EWA(h)

ACC NR: AP6003970 SOURCE CODE: UR/0104/65/000/005/0093/0093

AUTHOR: Sarkisov, M. A.; Rokotyan, S. S.; Uspenskiy, B. S.; Sharov, A. N.; Zhulin, I. V.; Fedoseyev, A. M.; Korolev, M. A.; Kheyfits, M. E.; Yermolenko, V. M.; Petrov, S. Ya.; Azar'yev, D. I.; Krikunchik, A. B.; Polyakov, L. P.; Sazonov, V. I.; Khvoshchinskaya, Z. G.; Kartsev, V. L.; Smelyanskaya, B. Ya.; Kozhin, A. N.; Losev, S. B.; Dorodnova, T. N.; Rubinchik, V. A.; Smirnov, E. P.; Rudman, A. A.

ORG: none

50
B

TITLE: Abram Borisovich Chernin

SOURCE: Elektricheskiye stantsii, no. 5, 1965, 93

TOPIC TAGS: electric engineering, electric engineering personnel

ABSTRACT: An engineer since 1929, A. B. Chernin has worked for years in developing new techniques and equipment for relay protection 25 of electric power systems. In this 60th birthday tribute, he is credited with leading the group which produced the directives on relay protection, contributing to the development of a method for calculating transient processes in long distance 400-500 kv power transmission lines and with aiding in planning of the electric portions of power stations, substations and power systems. The results of his engineering and scientific work have been published 46 times, he is a doctor of technical sciences (since 1963), and has taught for 30 years at the Moscow Power Institute. Orig. art. has: 1 figure. [JPRS]

SUB CODE: 09 / SUBM DATE: none

HW
Card 1/1

ZHUKHOVITSKIY, S.Yu.; VOYTSEKHOVSKIY, A.P.

A possible cause of pipe freezing. Azerb. neft. khoz. 40 no.1:24 Ja '61. (MIRA 14:8)

(Pipe)

ZHUKHOVITSKIY, Solomon Yul'yevich; ISAYEVA, V.V., vedushchiy red.;
POLOSINA, A.S., tekhn.red.

[Controlling the parameters of clay muds] Regulirovanie parametrov glinistykh rastvorov. Moskva, Gos.nauchno-tekhn. izd-vo neft. i gorno-toplivnoi lit-ry, 1960. 157 p. (MIRA 14:4)

(Drilling fluids)

ZHUKHOVITSKIY, S.Yu.; RYABCHENKO, V.I.

It is necessary to replace the SPV-5 viscosimeter by the SPV-4 viscosimeter; a topic for discussion. Neft. khoz. 38 no.9:47-52 S '60. (MIRA 13:9)

(Viscosimeter)

ZHUKHOVITSKIY, S.Yu.

Rating the coagulation degree of drilling fluids. Neft.khoz. 35 no.2:18-22 F '57. (MLRA 10:3)

(Oil well drilling fluids)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002064920004-4"

ZHUKHOVITSKIY, S.Yu.

Efficient principle for controlling the viscosity and static pressure of dislocation of drilling muds. Neft.khoz. 37 no.2:38-43 F '59. (MIRA 12:4)
(Oil well drilling fluids)

ZHUKHOVITSKIY, S. Yu.

Name: ZHUKHOVITSKIY, S. Yu.

Dissertation: Thickening of drilling muds and a method for determining causes

Degree: Cand Tech Sci

Defended at: ~~Affiliation~~: Min Higher Education USSR, Moscow Order of Labor Red Banner Petroleum Inst imeni Academician I. M. Gubkin

Publication ~~Defense Date~~, Place: 1956, Krasnodar

Source: Knizhnaya Letopis', No 4, 1957

ASAN-NURI, A.O., red.; ZHUKHOVITSKIY, S.Yu., red.; KARASEV, A.K., red.; KOVTUNOV, G.A., ~~starshiy nauchnyy~~ sotrudnik, red.; SHTEYNER, S.I., red.; ISAYEVA, V.V., vedushchiy red.; POLOSINA, A.S., tekhn.red.

[Perfecting oil and gas drilling practices] Sovershenstvovanie tekhniki i tekhnologii bureniia na neft' i gaz; materialy. Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1960. 347 p. (MIRA 13:9)

1. Vserossiyskoye soveshchaniye rabotnikov bureniya, Krasnodar, 1958. 2. Rukovoditel' laboratorii promyvochnykh zhidkostey Krasnodarskogo filiala Vsesoyuznogo nauchno-issledovatel'skogo instrumental'nogo instituta (for Zhukhovitskiy). 3. Krasnodarskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instrumental'nogo instituta (for Kovtunov).

(Oil well drilling)

ZHUKHOVITSKIY, S.Yu.

System for controlling the structural and mechanical properties of clay muds. Neft. khoz. 43 no.3:27-34 Mr '65. (MIRA 18:6)

Zhukhovitskiy, S. Yu.

93-6-5/20

AUTHOR: Zhukhovitskiy, S. Yu.

TITLE: Measuring the Static Shear Stress of Clay Solutions (Ob izmerenii staticheskogo napryazheniya sdviga glinistykh rastvorov)

PERIODICAL: Neftyanoye khozyaystvo, 1957, Nr 6, pp. 17-19 (USSR)

ABSTRACT: In order to characterize the mechanical properties of clay solutions a great number of constants must first be determined. These constants fall within five main groups, namely, elasticity, viscosity, boundary stress, yield points, and strength of structure. Most of these constants must be taken into consideration in determining static shear stress. The questions raised in A.A. Linevskiy's article (Neftyanoye khozyaystvo, Nr 4, 1954) can be answered only after a detailed analysis of processes taking place in rotational instruments with coaxial cylinders or with a tangentially moving disc (Rebinder-Veyler instrument). After the outer cylinder of the former instrument has begun to move, or after the table of the latter instrument has been lowered, the rotation of the cylinders and the shift of the table and disc coincide. This takes place within the limits of elastic deformation of the clay solution. As the rotation of the outer cylinder or lowering of the table continues, the acting stresses exceed the flow (creep) of the clay solution in the area of intact structure. The plastic deformation taking place, as correctly noted by Kister, E.G., and Zlotnik, D.Ye, (Neftyanoye khozyaystvo, Nr 4, 1955) is considerable and can be easily observed.

Card 1/2

93-6-5/20

Measuring the Static Shear Stress of Clay Solutions (cont)

A.A. Linevskiy erroneously erroneously took it to be the consequence of overcoming the static shear stress. As the rotation of the outer cylinder or the lowering of the table continues, the stress reaches its maximum, above which a quickly spreading rupture of structure occurs. The maximum stress causing this rupture of structure is defined as the static shear stress. The U-shaped tube instrument recommended by Linevskiy cannot be used for measuring the static shear stress. The determination of the static shear stress of clay solution is of considerable importance in selecting oil well drilling fluids which must possess a consistency capable of holding in suspension and bringing the cuttings from the bottom of the bore hole to the surface. In conclusion it is stated that the static shear stress of clay solutions is measured by the maximum torque angle of the suspended cylinder in rotational instruments (CHC-1, CHC-2) and by the maximum elongation of the spring in Rebinder-Veyler type of instrument. The instrument with a U-shaped tube, recommended by A.A. Linevskiy, is not based on the right principles and for that reason it is unsuitable for measuring static shear stress of structural systems. There are eight Slavic references.

AVAILABLE: Library of Congress

Card 2/2

ZHUKHOVITSKIY, S.Yu.

[redacted]

Measuring static pressure of dislocation of drilling muds. (MIRA 10:7)
Neft.khoz. 35 no.6:17-19 Je '57.
(Oil well drilling fluids) (Strains and stresses)

Glinistyye rastvory v burenii (Clay mortar in drilling) Moskva, Gostoptekhizdat, 1955.
170 p. Diagrs., tables.
Literatura: p. (169)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002064920004-4"

ZHUKHOVITSKIY, S.Yu.; KOVALEVA, A.A., redaktor; TROFIMOV, A.V., redaktor

[Drilling fluids] Glinistye rastvory v burenii. Moskva, Gos. nauchno-tekhn. izd-vo neftianoi i gornotoplivnoi lit-ry, 1955. 170 p. (MIRA 8:10)
(Oil-well drilling fluids)

ZHUKHOVITSKIY, S.Yu.

Method for determining the degree of coagulation of drilling muds. Trudy VNII no.17:106-122 '58. (MIRA 12:1)
(Oil well drilling fluids)

ZHUKHOVITSKII, S.Yu.; TOVAROVA, M.L.

Effect of drilled clay on clay muds. Trudy KF VNII no.5:169-173 '61. (MIRA 14:10)

(Oil well drilling fluids)

ZHUKHOVITSKIY, S.Yu.

URV-3 universal rotatory viscosimeter-plastometer with an independent rotor. Trudy KF VNII no.5:174-177 '61. (MIRA 14:10)
(Viscosimeter) (Oil well drilling fluids)

Zhukhovitskiy, Ye.

KORNFEL'D, M.; ZHUKHOVITSKIY, Ye.

Measurement of the elasticity modulus of substances with high-degree sound absorption. Zhur.tekh.fiz.25 no.11:1998-2007 O '55. (MLRA 9:1)
(Elasticity--Measurement)

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Convective instability spectrum of a conducting medium in a magnetic field. Zhur.eksp.i teor.fiz. 42 no.4:1122-1125 Ap '62.
(MIRA 15:11)

1. Permskiy gosudarstvennyy universitet i Permskiy gosudarstvennyy pedagogicheskiy institut.
(Magnetohydrodynamics)

ZHUKHOVITSKIY, YE. M.

USSR/Physics - Heat Exchange May 52

"Free Stationary Convection in an Infinite Horizontal Tube," Ye. M. Zhukhovitskiy, Molotov State U

"Zhur Tekh Fiz" Vol XXII, No 5, pp 832-835

Solves problem of weak, free, stationary convection in an infinite horizontal cylindrical cavity at a given temp gradient toward infinity by the method of power-expansion of Grasshof's number up to the 2d approximation inclusive. Received 16 Jan 52.

222T86

ZHUKHOVITSKIY, Ye. M.

USSR/Physics - Stability of convection FD-655

Card 1/1 : Pub. 85 - 10/20

Author : Zhukhovintskiy, Ye. M. (Molotov)

Title : Application of the Galerkin method to the problem of the stability of a nonuniformally heated liquid

Periodical : Prikl. mat. i mekh., 18, 205-211, Mar/Apr 1954

Abstract : Develops a method for solving approximately the problem of the conditions for the occurrence of thermal convection in liquid heated from below. Presents examples of the application of this method to cases of vertical and horizontal cylindrical zones. Seven references, including V. S. Sorokin, "Variational method in the theory of convection," PMM, 17, No 1, 1953.

Institution : Molotov State Pedagogic Institute

Submitted : January 27, 1953

FD-3096

USSR/Physics - Convection

ZHUKHOVITSKIY, YE.M.

Card 1/1 Pub. 85 - 11/16

Author : Zhukhovitskiy, Ye. M. (Molotov)

Title : Stability of nonuniformly heated fluid in a vertical elliptical cylinder

Periodical : Prikl. mat. i mekh., 19, Nov-Dec 1955, 751-755

Abstract : The author considers the problem of the conditions governing the occurrence of thermal convection in a vertical elliptical cylinder heated from below. He solves the problem approximately by the Galerkin method (S. G. Mikhlin, Pryamyye metody v matematicheskoy fizike [Direct methods in mathematical physics], State Technical Press, 1950), after deriving the principal equations (cf. author's "Application of Galerkin to problem of stability of nonuniformly heated fluid," ibid., 18, No 2, 1954). The author notes that his calculated results are in agreement with the experimental results of V. V. Slavnov (Dissertation, Molotov University, 1952). Five references: e.g. V. S. Sorokin, "Variational method in theory of convection," ibid., 17, No 1, 1953.

Institution :

Submitted : November 29, 1954

SOV/126-6-3-1/32

AUTHOR: Zhukovitskiy, Ye. M.

TITLE: On the Stability of a Non-Uniformly Heated Electrically Conducting Liquid in a Magnetic Field (Ob ustoychivosti neravnomerno nagretoy elektroprovodyashchey zhidkosti v magnitnom pole)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 3, pp 385-394 (USSR)

ABSTRACT: Sorokin has shown (Ref.1) that a liquid heated from underneath in such a way that a constant uniform vertical temperature gradient appears in it may be in equilibrium. This equilibrium will be stable only if the temperature gradients are small. If the temperature gradient reaches a certain critical value definite motion will occur in the liquid. There exists an increasing sequence of cricital gradients which is such that, when the liquid passes through each of them, its equilibrium becomes unstable with respect to the corresponding perturbations. If the liquid is electrically conducting and is placed in the magnetic field, then when motion occurs, electrical currents will be induced in the liquid and the interaction of these currents with the field will have an effect on the motion. The conditions under which convective motion will occur in an electrically

Card 1/7

SOV/126-6-3-1/32

On the Stability of a Non-Uniformly Heated Electrically Conducting Liquid in a Magnetic Field

conducting liquid may also depend on the magnetic field and, in part, the presence of a magnetic field may alter the magnitude of the critical gradients and the form of critical motion. It has been shown (Refs.2 and 3) that the presence of a magnetic field improves the stability of equilibrium: convection will occur at higher temperature gradients than in the absence of the field. In the present paper a study is made of the occurrence of convective motion in an electrically conducting liquid in the presence of an external magnetic field. The particular problem considered is that of an infinite vertical cylinder (the corresponding problem for the case when the field is absent was solved by Ostroumov (Ref.7)). The equations describing convective motion of an incompressible electrically conducting liquid in the magnetic field are written down in the usual form (Eqs.1, 2 and 3). These equations are completed by the addition of Maxwell's equations (Eqs.4, 5 and 6) and the equation describing Ohm's

Card 2/7

SOV/126-6-3-1/32

On the Stability of a Non-Uniformly Heated Electrically Conducting Liquid in a Magnetic Field

law in a moving liquid (Eq.7). It is assumed that displacement currents may be neglected in comparison with conduction currents and furthermore, in the heat conduction equation viscous dissipation and Joule heat may also be excluded. The equations are then re-expressed in a non-dimensional form:

$$\frac{\partial \vec{v}}{\partial t} = -\nabla(p + M^2 \vec{a}\vec{H}) + \Delta\vec{v} + Ra \cdot \vec{\gamma}T + M^2(\vec{a}\nabla)\vec{H} \quad , \qquad (13)$$

$$P\frac{\partial T}{\partial t} = \vec{\gamma}\vec{v} + \Delta T \quad , \qquad (14)$$

$$P_m\frac{\partial \vec{H}}{\partial t} = (a\nabla)v + \Delta\vec{H} \quad . \qquad (15)$$

Here, $\vec{H}$ is the intensity of the magnetic field, $\vec{v}$ is the velocity of the liquid, p is the pressure, M is the so-called Hartman number:

Card 3/7

$$M = \frac{\mu R H_0}{c}\sqrt{\frac{\sigma}{\rho_0 \nu}}$$

; $\vec{H}_0$ is the constant internal magnetic field, Ra is the Rayleigh number, $\vec{\gamma}$ is a unit vector in the vertical direction, T is the temperature and $P_m = \frac{4\pi\mu\sigma\nu}{c^2}$ where μ, σ, ν are the magnetic permeability, electrical conductivity and kinematic viscosity respectively. The parameter P_m characterises the properties of the liquid. For mercury this parameter is approximately equal to 10^{-7}. Eqs.(13) and (15) are linear and should therefore contain a time factor $\exp(-\omega t)$ where in general, ω is complex so that $\omega = \omega_1 + i\omega_2$. The equilibrium of the liquid will be stable if $\omega_1 > 0$ and in this case the perturbations are

SOV/126-6-3-1/32

On the Stability of a Non-Uniformly Heated Electrically Conducting Liquid in a Magnetic Field

damped out. If $\omega_1 < 0$ perturbations will develop. To find the critical stage it is necessary to put $\omega_1 = 0$. Following (Ref.1), the author seeks to find solutions corresponding to vibrational motion in the presence of a magnetic field. It is shown that no general conclusions can be made but in the special case when $M^2 P_m \ll 1$, some information can be obtained. Thus, for example, for mercury, $P_m \sim 10^{-7}$ and vibrations will occur if $M^2 \sim 10^3$. If the linear dimensions of the cavity are of the order of a few centimetres, this value of M corresponds to magnetic fields of the order of 10^5 gauss. Thus, in laboratory conditions, vibrational motion in mercury when it is heated from underneath will not occur. Under these conditions perturbations will be damped out or will grow monotonically. The next problem considered is the occurrence of convection in the vertical cylinder discussed above. The constant magnetic field $\vec{H}_0$ is taken to be perpendicular to the axis of the cylinder and the walls of the cylinder are taken as non-conducting and dielectric. In

Card 5/7

SOV/126-6-3-1/32

On the Stability of a Non-Uniformly Heated Electrically Conducting Liquid in a Magnetic Field

the case when the magnetic field is absent, the lowest critical gradient corresponds to motion which is such that the liquid flows parallel to the axis of the cylinder. The cylinder is divided by a vertical plane into two parts, in one of which the liquid moves up and in the other, down. The orientation of the plane is arbitrary (cf Refs.6 and 7). When the transverse magnetic field is present, the orientation of this dividing plane ceases to be arbitrary. Two cases are therefore considered and the problem is solved by the method described by Galerkin (Ref.11). These cases are: (a) the vector $\vec{H}_0$ lies in the dividing plane and, (b) the vector $\vec{H}_0$ is perpendicular to the dividing plane. It is shown that motion of type (a) for an arbitrary value of Hartman's number corresponds to lower values of Ra_m than motion of type (b) (Ra_m is a minimum value of Rayleigh's number). It follows that as the vertical temperature gradient

Card 6/7

SOV/126-6-3-1/32

On the Stability of a Non-Uniformly Heated Electrically Conducting Liquid in a Magnetic Field

in an electrically conducting liquid is increased, motion should occur with the dividing plane parallel to the intensity of the internal magnetic field. Since for small values of Hartman's number (small fields), the values of Ra_m corresponding to both the cases considered are close to each other, under experimental conditions motion of type (б) may occur, particularly when conditions are favourable, for example, when the inclination of the axis of the cylinder to the plane ($\vec{H}_0$, $\vec{g}$) is small. Prof. G. A. Ostroumov is thanked for bringing this problem to the author's attention. There are 3 figures and 12 references, of which 6 are Soviet, 6 English.

ASSOCIATION: Permskiy gosudarstvennyy pedagogicheskiy institut (Perm' State Pedagogical Institute)

SUBMITTED: January 4, 1957.

1. Liquids--Stability 2. Liquids--Electrical properties
3. Magnetic fields--Applications 4. Liquids--Magnetic factors

Card 7/7

GERSHUNI, G.Z. (Perm'); ZHUKHOVITSKIY, Ye.M. (Perm')

Parametric instability of the revolution of a fluid as a rigid body. Prikl. mat. i mekh. 28 no.5:829-834 S-O '64. (MIRA 17:11)

L 44114-66 EWT(1) DJ SOURCE CODE: UR/0040/66/030/004/0699/0704

ACC Nr: AP6028323

44

B

AUTHOR: Gershuni, G. Z.; Zhukhovitskiy, Ye. M.; Shaydurov, G. F.

ORG: None

TITLE: The Convective Instability of a Fluid in Connected Vertical Channels

SOURCE: Prikladnaya matematika i mekhanika. v. 30, no. 4, 1966, 699-704

21

TOPIC TAGS: Heat convection, fluid thermal instability

ABSTRACT: An exact solution is presented of the problem of thermal instability of a fluid in two vertical parallel plane channels separated by a solid mass. Critical values were found for the Rayleigh number determining the stability limit, and its dependence on the thermal conductivity of the fluid and the mass and the distance between the channels. Orig. article has: 4 figures and 24 formulas. (AV)

SUB CODE: 20/ SUBM DATE: 08Jan66/ ORIG. REF: 008/ OTH REF: 003

Card 1/1 egh

ACC NR: AP6034539 SOURCE CODE: UR/0421/66/000/005/0056/0062

AUTHOR: Gershuni, G. Z. (Perm'); Zhukhovitskiy, Ye. M. (Perm'); Tarunin, Ye. L. (Perm')

ORG: None

TITLE: Numerical investigation of convective motion in a closed cavity

SOURCE: AN SSSR. Izvestiya. Mekhanika zhidkosti i gaza, no. 5, 1966, 56-62

TOPIC TAGS: thermal convection, incompressible fluid, motion mechanics, Prandtl number, Nusselt number

ABSTRACT: The method of finite differences is used for solving the complete nonlinear problem of two-dimensional convective motion of a viscous incompressible fluid in a long horizontal cavity of square cross section. The temperature of the fluid at one vertical boundary is taken as the reference value and that on the opposite vertical boundary is assumed as constant, while the temperature along the horizontal boundaries varies linearly. Stationary numerical results are found for the distribution of velocity and temperature when the Prandtl number is held constant at unity while the Grashof number varies from 0 to $4 \cdot 10^5$. These data may be used for studying the formation of a closed boundary layer and a very slowly moving nucleus with a constant vertical temperature gradient. The heat flux through the cavity is found as a function of the Grashof number. Numerical calculations give nonstationary solutions when

ACC NR: AP6034539

$Gr>4\cdot10^5$: following a transition stage, stationary oscillations are set up for which the stream function and the temperature as well as all parameters of the solution—temperature gradient in the nucleus, Nusselt number, etc.—fluctuate around certain average values, the frequency of these fluctuations increasing with Gr. These oscillations may possibly be due to the development of small-scale motions, although it is also possible that they have a physical basis in the formation of traveling waves in the boundary layer which have been experimentally observed. Orig. art. has: 8 figures, 11 formulas.

SUB CODE: 20/ SUBM DATE: 04Apr66/ ORIG REF: 010/ OTH REF: 009

Card 2/2

ACC NR: AP7001575 (A) SOURCE CODE: UR/0421/66/000/006/0093/0099

AUTHORS: Gershuni, G. Z. (Perm'); Zhukhovitskiy, Ye. M. (Perm'); Tarunin, Ye. L. (Perm')

ORG: none

TITLE: Numerical study of the convection of a liquid heated from below

SOURCE: AN SSSR. Izvestiya. Mekhanika zhidkosti i gaza, no. 6, 1966, 93-99

TOPIC TAGS: digital computer, heat convection, Nusselt number, Reynolds number, Prandtl number, boundary value problem, mathematic determinant/ Aragats digital computer

ABSTRACT: This paper presents a numerical study of the plane convective motion of a liquid in a closed square cavity (see Fig. 1).

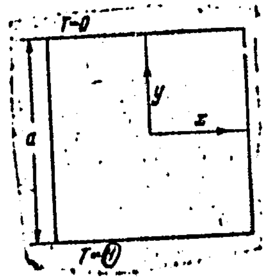


Fig. 1.

Card 1/3

ACC NR: AP7001575

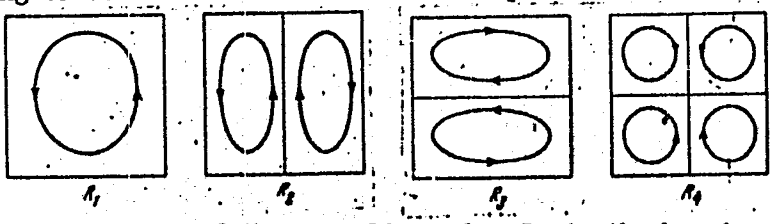
The convection equations for the flow function ψ and temperature T in dimensionless form are:

$$\frac{\partial}{\partial t}\Delta\psi+\left(\frac{\partial\psi}{\partial y}\frac{\partial\Delta\psi}{\partial x}-\frac{\partial\psi}{\partial x}\frac{\partial\Delta\psi}{\partial y}\right)=\Delta\Delta\psi-G\frac{\partial T}{\partial x}\left(G=\frac{g\beta\theta a^3}{\nu^2}\right)$$

$$\frac{\partial T}{\partial t}+\left(\frac{\partial\psi}{\partial y}\frac{\partial T}{\partial x}-\frac{\partial\psi}{\partial x}\frac{\partial T}{\partial y}\right)=\frac{1}{P}\Delta T\quad\left(P=\frac{\nu}{\chi}\right),$$

where G and P are the Grashof and Prandtl numbers. The units of distance, time, the flow function, and temperature are a, a^2/ν, ν, and θ, respectively. The method of nets is used to solve the initial system of equations, and the critical motions corresponding to the first four levels of the spectrum are shown (see Fig. 2).

Fig. 2.



The lower critical value of the Reynolds number R_1 is the boundary of equilibrium stability. It was found that at values of G below a certain critical value G_1 all initial perturbations are attenuated and equilibrium is the limiting stationary regime. Stationary oscillations exist only in the range of Grashof numbers of

Card 2/3

ACC NR: AP7001575

$5090 < G < 62\,000$. Calculations with a 25 x 25 net showed that the frequency and form of these oscillations are determined only by the parameter G. Metastable motions are discussed briefly. Orig. art. has: 13 formulas, 6 diagrams, and 4 graphs.

SUB CODE: 20/, 09/ SUBM DATE: 18Jun66/ ORIG REF: 006/ OTH REF: 007

Card 3/3

BIRIKH, R.V. (Perm'); GERSHUNI, G.Z. (Perm'); ZHUKHOVITSKIY, Ye.M. (Perm')

Spectrum of perturbations of plane-parallel flows at small Reynolds numbers. Prikl. mat. i mekh. 29 no.1:88-98 Ja-F '65. (MIRA 18:4)

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.; ZAYTSEV, V.M.

Electronic structure of the methane molecule. Zhur. strukt. khim. 5 no.4:598-603 Ag '64. (MIRA 18:3)

1. Permskiy gosudarstvennyy universitet i Permskiy gosudarstvennyy pedagogicheskiy institut.

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye M.

Rotation of a sphere in a viscous conducting liquid in a magnetic field at high Reynolds numbers. Zhur.tekh. fiz. 34 no. 2:336-339 F '64. (MIRA 17:6)

1. Permskiy gosudarstvennyy universitet i Permskiy gosudarstvennyy pedagogicheskiy institut.

ACCESSION NR: AP4015965

S/0040/63/027/005/0779/0783

AUTHORS: Gershuni, G. Z. (Perm'); Zhukhovitskiy, Ye. M. (Perm')

TITLE: Parametric excitation of convective instability

SOURCE: Prikl. matem. i mekhan., v. 27, no. 5, 1963, 779-783

TOPIC TAGS: parametric excitation, convective instability, temperature gradient, nonstationary equilibrium, auto oscillation, parametric resonance, heat equation, skin effect

ABSTRACT: Convective stability of a fluid in a gravity field is generally studied under the assumption that the equilibrium temperature gradient does not depend on time. Nonstationary equilibrium of fluid is also possible, where the equilibrium temperature changes with time by a law determined by nonstationary heating conditions. Apparently, stability of such nonstationary equilibrium has not yet been studied. The authors are interested particularly in the case where the equilibrium temperature gradient changes periodically with time. The fluid is represented as an auto-oscillating system with periodically changing parameter. Under such conditions, interesting phenomena of the parametric resonance type are to be expected. The authors investigate stability of equilibrium of a plane horizontal fluid layer

Card 1/2

Card 2/2

ACCESSION NR: AP4013424 S/0057/64/034/002/0336/0339

AUTHOR: Gershuni, G. Z.; Zhukhovitskiy, Ye.M.

TITLE: Rotation of a sphere in a viscous conductive liquid in a magnetic field at large Reynolds numbers

SOURCE: Zhurnal tekhn.fiz., v.34, no.2, 1964, 336-339

TOPIC TAGS: magnetohydrodynamics, turbulent magnetohydrodynamics, turbulence, boundary layer, magnetohydrodynamic boundary layer

ABSTRACT: The rotation of a non-conducting sphere in a viscous conducting liquid in the presence of a uniform magnetic field parallel to the axis of rotation is discussed. The hydrodynamic Reynolds number is assumed to be large, so that a boundary layer is formed; the magnetic Reynolds number is assumed to be small, so that the induced field is small compared with the applied field. The velocity of the liquid in the boundary layer of uniform thickness d is assumed to be given by

$$v_\varphi = \omega R (1-z)^2 \sin\theta; \quad v_\theta = a\omega R z (1-z)^2 \sin 2\theta$$

where r, θ, φ are the usual spherical coordinates, R is the radius of the sphere, a is a constant to be determined with d, and

Card 1/2

ACC.NR: AP4013424

$$z = (r-R)/d.$$

Expressions are derived for the components of the current induced in the liquid. The currents are small outside the boundary layer. The parameters a and d describing the boundary layer are evaluated by integrating the Stokes-Navier equations (including the electromagnetic forces) across the boundary layer, employing the equation of continuity to eliminate the radial component of the velocity. Finally, an expression is derived for the braking (retarding) torque on the rotating sphere. For small applied fields, the braking torque is a linear function of the square of the applied field strength; for large applied fields, the torque is proportional to the field strength. The torque obtained here for large fields agrees within 2% with that previously calculated (G.Z.Gershuni and Ye.M.Zhukhovitskiy, ZhTF, 30, 1067, 1960) for small Reynolds numbers. Orig.art.has: 26 formulas.

ASSOCIATION: Permskiy gosudarstvenny*y universitet (Perm' State University); Permskiy gosudarstvenny*y pedagogicheskiy institut (Perm' Pedagogical Institute)

SUBMITTED: 24Jan63 DATE AC:Q 26Feb64 ENCL: 00

SUB CODE: PH NR REF SOV: 001 OTHER: 002

Card 2/2

GERSHUNI, G.Z. (Perm'); ZHUKHOVITSKIY, Ye.M. (Perm')

Parametric induction of convective instability. Prikl. mat. i mekh. 27 no.5:779-783 S-O '63. (MIRA 16:10)

GERSHUNI, G.Z. (Perm'); ZHUKHOVITSKIY, Ye.M. (Perm')

Convective instability of a two-component mixture in a gravitational field. Prikl.mat.i mekh. 27 no.2:301-308 Mr-Ap '63. (MIRA 16:4)

(Heat—Convection) (Gravity)

37117

S/056/62/042/004/033/037
B125/B102

24.6714

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M.

TITLE: Convective instability spectrum of a conducting medium in a magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 4, 1962, 1122-1125

TEXT: The conditions for oscillatory convective instability of a conducting medium in a magnetic field are determined. A vertical plane layer of a conducting medium is heated from below in a magnetic field. The equilibrium is disturbed so that the velocity $\vec{v}$ and the perturbation of the field $\vec{H}$ are vertical. The temperature perturbation is T = T(x,t), where x is the coordinate taken from the center of the layer in a transverse direction. The pressure gradient is zero, and all quantities depend on the time t as $e^{\lambda t}$. Then, the equations derived from the ordinary equations of magnetohydrodynamics

$$\lambda v = v'' + RT + M^2H', \quad \lambda PT = v + T'', \quad \lambda P_m H = v' + H'' \qquad (1),$$

Card 1/3

S/056/62/042/004/033/037
B125/B102

Convective instability spectrum ...

(R = Rayleigh number, M = Hartmann number, P = Prandtl number, $P_m = 4\pi\sigma\nu/c^2$), have the solution $v = v_0 \sin\pi x$, $T = T_0 \sin\pi x$, $H = H_0 \cos\pi x$ (2), if v = 0, T = 0 holds for the ideally conducting boundaries $x = \pm 1$ of the layer. The equations for the eigenvalues λ of the perturbations (2) give the equations $R_1 = \pi^4 + \pi^2 M^2$ (7),

$$R_2 = \pi^4 \frac{(P + P_m)(1 + P_m)}{P_m^2} + \pi^2 \frac{1 + P_m}{1 + P} \frac{P^2}{P_m^2} M^2, \quad (8), \text{ and}$$

$$b^2 = \pi^4 \frac{P}{P_m} \left(\frac{M^2}{\pi^2} \frac{P_m - P}{1 + P} - 1 \right). \quad (9)$$

for the branches of the stability curves for monotonic and oscillatory perturbations. (7) and (8) are straight lines in the plane (R, M^2). As V. S. Sorokin pointed out that oscillatory instability occurs with certain properties of the medium $(4\pi\sigma\chi/c^2 > 1)$ and sufficiently strong fields $(M > \bar{M})$. The critical field strength $\bar{M}^2 = \pi^2(1 + P)(P_m - P)$ follows from the condition $R_1 = R_2$. This condition is evidently fulfilled for cavities of any shape. The necessary condition for the existence of an oscillatory

Card 2/3

Convective instability spectrum ... S/056/62/042/004/033/037
B125/B102

instability reads

$$P_m/P > \int |T|^2 dV \int |\mathrm{rot}\, \mathbf{H}|^2 dV \Big/ \int |\mathbf{H}|^2 dV \int |\nabla T|^2 dV \qquad (14),$$

the right-hand side being of the order of 1. There is 1 figure. The English-language reference reads as follows: S. Chandrasekhar. Phil. Mag., 43, 501, 1952.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm State University) Permskiy gosudarstvennyy pedagogicheskiy institut (Perm State Pedagogical Institute)

SUBMITTED: November 22, 1961

Card 3/3

S/057/60/030/008/007/019
B019/B060

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M.

TITLE: The Flow of a Conductive Liquid Around a Sphere in a Strong Magnetic Field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 8, pp. 925 - 926

TEXT: The authors consider the flow around a sphere of a conductive liquid with a low Reynolds number in a magnetic field. The field direction is assumed to lie in the direction of flow. They proceed from the steady-state equations (2) and (3) in nondimensional quantities, and obtain solutions (4) which, for weak magnetic fields, correspond to the results obtained by Chester (Ref. 1). The calculation of the coefficients is dealt with, and it is finally stated that with large field strengths resisting power grows proportionally with the field. There are 4 references: 3 Soviet and 1 American.

VC

Card 1/2

The Flow of a Conductive Liquid Around a Sphere in a Strong Magnetic Field

S/057/60/030/008/007/019
B019/B060

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University). Permskiy pedagogicheskiy institut (Perm' Pedagogical Institute)

SUBMITTED: February 22, 1960

Card 2/2

ZHUKHOVITSKIY, E. M., GERSHUNI, G. Z. (Perm)

"On the Motion of an Electrically Conducting Fluid Surrounding a Rotating Sphere in the Presence of a Magnetic Field."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.

ZHUKHOVITSKIY, Ye. M.

40-5-10/20

AUTHOR: ZHJKHOVITSKIY, Ye.M. (Perm')

TITLE: On the Stability of a Nonuniformly Heated Liquid in a Spherical Cavity (Ob ustoichivosti neravnomerno nagretoy zhidkosti v sharovoy polosti)

PERIODICAL: Prikladnaya Mat. i Mekh., 1957, Vol.21, Nr 5 pp.689-693 (USSR)

ABSTRACT: In the paper the problem of the stability of a heated Liquid in a spherical cavity is investigated. The medium in which the cavity is spared is assumed to be infinitely extended. The system is to be heated from below. The task of the paper is the calculation of the critical vertical temperature gradients for which the liquid lamination begins to become unstable. It is well-known that this temperature gradient depends on the Raleigh-number. Under the boundary conditions valid for the sphere the critical Raleigh-numbers are calculated for different cases with the aid of Galerkin's method. For the calculation according to Galerkin a series expansion set up with at first unknown functions is chosen for the velocity of the flow in the liquid, the functions are of such form that the boundary conditions are satisfied. A recurrent system of defining equations is given for the approximation functions which are set up as polynomials of three variables. The solution itself then can be obtained in

Card 1/2

On the Stability of a Nonuniformly Heated Liquid in a Spherical Cavity 40-5-10/20

spherical coordinates by Legendre polynomials. For a series of critical cases the critical Raleigh-numbers and the ratio of the heat conductivity coefficients of liquid and solid body were calculated. Some typical flow patterns for the critical cases are given.
There are 2 figures, no tables, and 2 Slavic references. The author mentions V.S. Sorokin [Ref.1] and I.G. Shaposhnikov

SUBMITTED: December 9, 1955

AVAILABLE: Library of Congress

Card 2/2

88010

S/170/60/003/012/007/015
B019/B056

11.9200

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M.

TITLE: Heat Transfer Through a Vertical Gap With Rectangular Cross Section in the Case of Strong Convection

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 12, pp. 63-67

TEXT: It is assumed that in the rectangular gap investigated in the present paper, the temperatures of its vertical walls are constant and amount to $-\theta$ and $+\theta$. In the horizontal cross sections the temperature changes from $-\theta$ to $+\theta$. First, the flow function is derived, the boundary layer being assumed to be considerably thinner than the thickness d and the height h of the gap. Next, the motion in the boundary layer is investigated. A system of equations for the velocity and the temperature of a liquid in the gap is given and approximate solutions are obtained. As a condition for the applicability of the approximate solutions obtained here, $GrPr \gg 50 l^{3/2}$, where Gr is the Grasshoff number, Pr the Prandtl

Card 1/3

88010

Heat Transfer Through a Vertical Gap With Rectangular Cross Section in the Case of Strong Convection

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B019/B056

number, and $\ell = h/d \gg 1$. Finally, a formula for the heat transfer through the gap is obtained. System of equations for velocity and temperature of the liquid:

$$v_x \partial v_x/\partial x + v_y \partial v_x/\partial_y = U dU/dx + \partial^2 v_x/\partial y^2 - Gr \gamma(x) T \qquad (5)$$

$$v_x \partial T/\partial x + v_y \partial T/\partial y = (1/Pr)\partial^2 T/\partial y^2 \qquad (6)$$

$$\partial v_x/\partial x + \partial v_y/\partial y = 0 \qquad (7)$$

The approximate solutions are:

$$v_x = p_o(z) + p_1(z)U(x) + p_2(z)\cos\frac{2\pi x}{l+1} \qquad (8)$$

$$T = q_1(z)T_o(x) + q_2(z)\cos\pi x/(l+1) \qquad (9)$$

$\gamma(x)$ is a function, which for the upper and the lower wall of the gap is 0, for the lateral walls -1 or +1. $z = y/\delta$, where δ is the thickness of the boundary layer, the coefficients p_i and q_i must be taken as polynomials corresponding to the boundary conditions. For the heat transfer through

Card 2/3

88010

Heat Transfer Through a Vertical Gap With Rectangular Cross Section in the Case of Strong Convection

S/170/60/003/012/007/015
B019/B056

the gap the relation

$$Q = -\varkappa \int_a^b (\partial T/\partial y)_0 dx = 0.739 \varkappa (GrPr)^{1/4} l^{9/8}$$

was obtained. There are 1 figure and 4 references: 3 Soviet.

ASSOCIATION: Gosudarstvennyy universitet, Gosudarstvennyy pedagogicheskiy institut, g. Perm' (State University, State Pedagogical Institute, Perm')

SUBMITTED: May 27, 1960

Card 3/3

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Rotation of a sphere in a viscous conducting liquid in a magnetic field. Zhur. tekh. fiz. 30 no.9:1067-1073 S '60. (MIRA 13:11)

1. Permskiy gosudarstvennyy universitet i Permskiy gosudarstvennyy Pedagogicheskiy institut.
(Magnetohydrodynamics)

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Conductive fluid flowing around a sphere in a strong magnetic field. Zhur.tekh.fiz. 30 no.8:925-926 Ag '60. (MIRA 13:8)

1. Permskiy gosudarstvennyy universitet i Permskiy pedagogicheskiy institut.
(Fluid dynamics) (Magnetic fields)

S/057/60/030/009/011/021
B019/B054

26.1410

AUTHORS: Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

TITLE: Rotation of a Sphere in a Viscous Conducting Liquid in a Magnetic Field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 9, pp. 1067-1073

TEXT: The authors study the motion of a viscous incompressible conducting liquid around a steadily rotating sphere in the presence of a magnetic field in the direction of the rotational axis. They assume the case of slow rotation in which the inertial forces can be neglected as compared with the viscous forces, i.e., they assume a low Reynolds number. The magnetic Reynolds number is also assumed to be low. The authors obtain expressions for the distribution of the velocity and the induced field, as well as formulas for the braking moment. In the case of weak fields, the braking moment increases proportionally to the square field strength. In the case of high field strengths, the dependence is linear. The problem arising with slow rotation of the sphere in a conducting liquid in a

/B

Card 1/2

Rotation of a Sphere in a Viscous Conducting Liquid in a Magnetic Field

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B019/B054

longitudinal magnetic field was solved in successive approximation by Yu. K. Krumin' (Ref. 1). He found a solution of this problem for weak fields in which the velocity distribution differs only slightly from that without a field. In the present paper, the authors obtain a general solution which also holds for strong fields. In this connection, the authors set up, in the first part, a linearized equation of motion of a viscous incompressible conducting liquid in dimensionless parameters. They obtain solutions for the velocity of the medium and the field strengths with the aid of Legendre polynomials and Bessel functions after a projection of the said equation of motion on the Z-axis which coincides with the rotational axis and the magnetic field direction. These general solutions are discussed for weak and strong fields. There are 3 Soviet references.

B

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University). Permskiy gosudarstvennyy pedagogicheskiy institut (Perm' State Pedagogical Institute)

SUBMITTED: March 25, 1960

Card 2/2

ZHUKHOVITSKIY, Ye. M.

PHASE I BOOK EXPLOITATION SOV/3762

Konferentsiya po magnitnoy gidrodinamike. Riga, 1958.

Voprosy magnitnoy gidrodinamiki i dinamiki plazmy; trudy Konferentsii. (Problems in Magnetohydrodynamics and Plasma Dynamics; Transactions of a Conference) Riga, Izd-vo AN Latviyskoy SSR, 1959. 343 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Akademiya nauk Latviyskoy SSR. Institut fiziki.

Editorial Board: D.A. Frank-Kamenetskiy, Doctor of Physics and Mathematics, Professor; A.I. Vol'dek, Doctor of Technical Sciences, Professor; I.M. Kirko, ~~Doctor of Physics and Mathematics; [illegible], Candidate of Physics and~~ Mathematics; V.G. Vital, Candidate of Physics and Mathematics; Yu.M. Krumin'; and V.Ya. Kravchenko.

Ed.: A. Teytel'baum; Tech. Ed.: A. Klyavinya

PURPOSE: This book is intended for physicists working in the field of magnetohydrodynamics and plasma dynamics.

COVERAGE: This volume contains the transactions of a conference held in Riga, June 1958, on problems in applied and theoretical magnetohydrodynamics. The objects of the conference were the investigation of the basic trends in theoretical and applied magnetohydrodynamics, establishing contact between the people doing research in different branches of magnetohydrodynamics, and promoting the participation of theoretical physicists in problems in applied magnetohydrodynamics. More than 160 persons from different parts of the Soviet Union took part in the conference, and 55 papers were read. Similar conferences are to be held regularly in the future; the next such conference is scheduled to be held in Riga in June 1960. In this present collection of the transactions of the conference, most of the papers and comments on papers are presented by the authors themselves in an abridged form. The book is divided into two parts: the first part deals with problems in theoretical magnetohydrodynamics and plasma dynamics, and consists of 35 articles on such aspects of the problem as the application of magnetohydrodynamics in astrophysics (D.A. Frank-Kamenetskiy), magnetohydrodynamics and the investigation of cosmic-ray variations (L.I. Dorman), acceleration of plasma in a magnetic field (G.V. Gordeyev and N.I. Oshchepkov), stability of shock waves and magnetohydrodynamics (A.I. Akhiyezer). The second part, consisting of 33 articles, deals with problems of experimental magnetohydrodynamics, including the application of physical simulation for investigation of electromagnetic processes in liquid metals (I.M. Kirko) and the development of electromagnetic pumps (P.G. Kirillov), at the Institute of Physics of the Academy of Sciences, Latvian SSR. Several articles are devoted to induction pumps, electromagnetic crucibles, electromagnetic stirrers for molten metals, and their application in the metallurgical industry including schematic diagrams of their power-supply systems. References are given at the end of most of the articles.

Card 9/12

7

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Closed convection boundary layer. Dokl.AN SSSR 124 no.2:298-300 Ja '59. (MIRA 12:1)

1. Permskiy gosudarstvennyy universitet imeni A.M. Gor'kogo i Permskiy pedagogicheskiy institut. Predstavleno akademikom M.A. Leontovichem.
(Heat--Convection)

ZHUKHOVITSKIY, Ye. M.

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Stationary convective motion of an electrically conducting liquid between parallel planes in a magnetic field. Zhur.eksp. i teor. fiz. 34 no.3:670-674 Mr '58. (MIRA 11:4)

1. Permskiy gosudarstvennyy universitet i Permskiy pedagogicheskiy institut.

(Liquids--Electric properties) (Magnetic fields)

ZHUKHOVITSKIY, Ye. M.

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Stability of stationary convective motion of an electrically conducting liquid between parallel vertical planes in a magnetic field. Zhur.eksp. i teor. fiz. 34 no.3:675-683 Mr '58. (MIRA 11:4)

1.Permskiy gosudarstvennyy universitet i Permskiy gosudarstvennyy pedagogicheskiy institut.
(Liquids--Electric properties)
(Magnetic fields)

124-57-2-2032 D

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 2, p 78 (USSR)

AUTHOR: Zhukhovitskiy, Ye.M.

TITLE: Methods for Solving Problems of the Theory of Free Thermal Convection and Some of Their Applications (Metody resheniya zadach teorii svobodnoy teplovoy konvektsii i nekotoryye ikh primeneniya)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Physical Sciences, presented to the Molotovskiy gos. un-t (Molotov State University), Molotov, 1954.

ASSOCIATION Molotovskiy gos. un-t (Molotov State University), Molotov

1. Heat exchange--Theory 2. Convection--Theory 3. Mathematics

Card 1/1

SOV/126-6-2-22/34

AUTHORS: Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

TITLE: Forced Vibrations in an Elasto-Plastic System (Vynuzhdennyye kolebaniya v uprugo-plasticheskoy sisteme)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 2, pp 339-346 (USSR)

ABSTRACT: Forced vibrations in an elasto-plastic system beyond the elastic limit are considered. Friction and hysteresis are taken into account. The resonance properties of such a system are discussed and compared with the experimental data given in Refs. 1 and 2. The equation of motion of a point under the action of an elasto-plastic force $F(x)$ and an external force $G \sin(\omega t + \varphi)$ is of the following form

$$m\ddot{x} + \lambda\dot{x} + F(x) = G \sin(\omega t + \varphi) \qquad (2)$$

where λ is the coefficient of friction and $F(x)$ is given by:

$$\left.\begin{aligned} F_I = k_1 x, \quad F_{II} = F_m + k_2(x - x_m), \\ F_{III} = k_1(x - \Delta), \quad F_{IV} = -F_m + k_2(x + x_m - \Delta). \end{aligned}\right\} \qquad (3)$$

Card 1/4

Forced Vibrations in an Elasto-Plastic System

where the various constants have the meaning indicated in Fig.1. The above equation is then re-written in the dimensionless form

$$\ddot{x} + \beta\dot{x} + f(\lambda) = g \sin (pt + \varphi) \tag{4}$$

where

$$p = \omega/\omega_o,\ g = G/F_m,\ \beta = \lambda/m\omega_o,\ f + F/F_m$$

$$\left.\begin{array}{l} f_I = x,\quad f_{II} = 1 + \alpha\,(x - 1), \\ f_{III} = x - \delta,\ f_{IV} = -1 + \alpha\,(x + 1 - \delta), \end{array}\right\} \tag{5}$$

$$\delta = \frac{\Delta}{x_m} \quad \text{and} \quad \alpha = \frac{k_2}{k_1} .$$

The problem consists of finding periodic solutions of the above equation which have a period $2\pi/p$, i.e. equal to the period of the forcer. The appropriate system of boundary conditions is given by Eq.(6). The equations are solved by an approximation method suggested by B. G. Galerkin.

In the case $\beta = 0$ the resonance curves are as shown in Figs. 2 and 3 ($\alpha = k_2/k_1$; cf. Fig.1). The form of the curves indicates the presence of considerable absorption due to hysteresis. The assymmetry of the curves becomes more pronounced as α decreases. The low frequency side of the resonance curve is steeper than the high frequency side. When the coefficient of friction is not zero the resonance frequency beyond the elastic limit increases as friction increases. In general, the resonance frequency decreases at larger amplitudes of vibration and the relation between the amplitude of vibration and the amplitude of the forcing function is non-linear. The problem was suggested by Professor M. Kornfel'd. There are 7 figures and 4 references, 3 of which are Soviet, 1 English.

Forced Vibrations in an Elasto-Plastic System SOV/126-6-2-22/34

ASSOCIATIONS: Permskiy gosudarstvennyy universitet (Perm' State University) and Permskiy pedagogicheskiy institut (Perm' Pedagogical Institute)

SUBMITTED: June 7, 1956

Card 4/4 1. Vibration--Theory 2. Mathematics--Applications

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Forced oscillations in elastic-plastic systems. Fiz. met. i metalloved. 6 no.2:339-346 '58. (MIRA 11:9)

1. Permskiy gosudarstvennyy universitet i Permskiy pedagogicheskiy institut.
(Vibrations) (Elastic solids) (Plasticity)

ZHUKHOVITSKIY, Ye.M.

Stability of irregulary heated electric current conductor liquids in magnetic fields. Fiz. met. i metalloved. 6 no.3:385-394 '58. (MIRA 11:10)

1. Permskiy gosudarstvennyy pedagogicheskiy institut.
(Electrolites) (Liquid metals) (Induction heating)

SOV/139-58-4-6/30

AUTHORS: Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

TITLE: Two Types of Unstable Convective Flow Between Parallel Vertical Planes (O dvukh tipakh neustoychivosti konvektivnogo dvizheniya mezhdu parallel'nymi vertikal'nymi ploskostyami)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 4, pp 43-47 (USSR)

ABSTRACT: The stability of stationary convective flow between parallel vertical planes held at different temperatures has already been investigated by the first author, using Galerkin's method (Ref.1). In the present paper the authors have used a more complicated form for the approximating functions (see Eqs.5), and have so found a more accurate approximate solution. This has allowed a more accurate calculation of the earlier results and has in addition uncovered a second type of instability, not given in the earlier work at all, a type with null phase velocity which the authors call a "standing disturbance" as opposed to a "travelling disturbance". Taking the planes to be $x = \pm 1$, the dimensionless equations for

Card1/4 stationary convective flow are given by Eq.(1). The stream and temperature functions φ and Θ of plane harmonic disturbances are given by Eqs.(2) and (3) with boundary conditions as in Eq.(4). G and P are the Grasshof and Prandtl numbers, k and ω the wave number and complex frequency of the disturbance. These equations were derived by the first author (Ref 1). The question of stability has thus been reduced to that of finding the eigen-values of equations (2) to (4). The authors find an approximate solution to this problem by assuming forms for φ and Θ of the type given in Eq.(5). They then make plausible guesses at φ_1, φ_2, Θ_1, Θ_2, see Eqs.(6) and (8). All boundary conditions are now satisfied by the approximate solution. This solution differs from the cruder approximation the first author used previously (Ref 1) in that the stream function φ is now the sum of two functions, with two variable coefficients, and that the additional boundary condition on Θ, Eq.(7), is taken into account. Using Galerkin's method, the authors obtain Eq.(12) for real eigen values of ω, and Eq.(11) for the corresponding relation between G and k. Eliminating ω between

Eq.(11) and Eq.(12), a curve is obtained in the (G,k) plane which the authors call a 'neutral curve' - i.e. one corresponding to real values of ω. From the position of the minimum on this curve the critical values of the Grasshof number G_m and the wave number k_m can be found. $\omega = 0$ gives a solution of Eq.(12), and the corresponding curve of G_m against log P is shown in Fig.1. In the range shown k_m was practically constant, increasing only from 1.6 to 1.7. This is the instability that was not revealed in the earlier work (Ref 1). Excluding $\omega = 0$, for $P > 1.8$ the authors obtain the second type of instability - the "travelling" type. For this type log G_m is plotted against log P in Fig.2 (full line). Eq.(14) is asymptotically true, and a good approximation for $P > 50$. For this type k_m increases from 0 to 1.6 at $P > 50$. For this type of disturbance there is a good agreement with the author's earlier work (Ref 1). Thus eq.(14) was also obtained, though with 224 instead of 214 in the numerator, and the asymptote was reached at $P = 0.96$.

 The main results can be summarised thus:

SOV/139-58-4-6/30

Two Types of Unstable Convective Flow Between Parallel Vertical Planes

For convective flow between two parallel planes held at different temperatures, instabilities appear if there is a large temperature difference between the planes. "Standing" disturbances correspond to $P < 1.8$, both types are possible for $P > 1.8$, though for $P > 2.2$ the "travelling" disturbances are the more dangerous as they correspond to a smaller Grasshof number.
There are 2 figures and 1 Soviet reference.

ASSOCIATIONS: Permskiy gosuniversitet (Perm' State University) and Permskiy pedagogicheskiy institut (Perm' Pedagogic Institute)

SUBMITTED: January 8, 1958

Card 4/4

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ZHUKHOVITSKIY, Ye.M.

ZHUKHOVITSKIY, Ye.M. (Perm').

Stability of an irregularly heated liquid in a spherical cavity.
Prikl. mat. i mekh. 21 no.5:689-693 S-O '57. (MLRA 10:11)
(Stability) (Heat--Convection)

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Two types of unsteady convection motion between parallel vertical surfaces. Izv.vys.ucheb.zav.; fiz. no.4:43-47 '58.
(MIRA 11:11)

1. Permskiy gosuniversitet i Permskiy pedagogicheskiy institut.
(Heat--Convection)

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M. SOV/ 56-34-3-20/55

TITLE: The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field (Statsionarnoye konvektivnoye dvizheniye elektroprovodyashchey zhidkosti mezhdu parallel'nymi ploskostyami v magnitnom pole)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 3, pp. 670-674 (USSR)

ABSTRACT: The two planes referrred to in the title may be heated to various temperatures. First, the equations of the motion of the medium (these are the equations of convection in the case investigated here) and the Maxwell equations for the field in the medium are written down. In the equation for the curl of the magnetic field, the displacement current is neglected and in the equation of heat conduction - the tough dissipation and Joule dissipation. The electric field strength and the current density are eliminated first from Maxwell's equation. The above-mentioned equations are subsequently converted into dimensionless variables. 4 dimensionless parameters occur in these equations. The authors investigate here the steady

Card 1/3

SOV/56-34-3-20/55

The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field

convection in the space between vertical parallel surfaces in the case of the presence of an exterior magnetic field which is vertical to the surfaces. If the linear dimensions of the surfaces are sufficiently great compared with the distance between them, then an accurate solution of the above-mentioned dimensionless equations can be determined which describes the steady solution in the part distanced from the ends of the gap formed by the surfaces. This motion has the following peculiarities: 1) The velocity $\vec{v}$ is always parallel to the z-axis. 2) The temperature T depends only on x. 3) The field-vector $\vec{H}$ is situated everywhere in the surface (xz), viz. it holds $H_y = 0$. 4) All values do not depend on y (plane problem) and except pressure, neither on z. In this case the z-axis is parallel to the surfaces and the x-axis is vertical to them. The authors determine here the distribution of temperature, velocity and field strength on the cross section. First, $T = -x$ is found. Also the terms for the velocity distribution and the magnetic field strength are given explicitely; all these formulae together represent the solution of the problem discussed here. A diagram demonstrates the velocity-distributions for the Gartman numbers $M = 0,5,10$.

Card 2/3

The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field

SOV/56-34-3-20/55

The velocitydistribution $v = Gx(x^2 - 1)/6$ is obtained with lacking field. The motion decreases rapidly with increasing field strength. Moreover, a peculiar boundary layer occurs in the flow: A thin layer with an important gradient of velocity is formed in the vicinity of the walls. Also the distribution of the induced magnetic field on the cross section is demonstrated by a diagram. Concluding, a formula for the vertical convective thermic flow is given. The solution found here describes the motion in a vertical gap in the presence of a transversal external field. It may, however, be readily generalized for cases with inclined gap and with an external field oriented at random. There are 2 figures and 3 references, 1 of which is Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm State University), Permskiy pedagogicheskiy institut (Perm Pedagogical Institute)

SUBMITTED: September 19, 1957

Card 3/3

ROZINA, Sof'ya Sinayevna; ZHUKHOVITSKIY, Yakov Moiseyevich

[City of Kashin and its health resort] Gorod Kashin i ego kurort. Kalinin, Kalininskoe knizhnoe izd-vo, 1957. 159 p. (MIRA 13:3)

(Kashin--Description)

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M. SOV/56-34-3-21/55

TITLE: On the Stability of Steady Convective Motion of an Electrically Conducting Liquid Between Parallel Vertical Planes in a Magnetic Field (Ob ustoychivosti statsionarnogo konvektivnogo dvizheniya elektroprovodyashchey zhidkosti mezhdu parallel'nymi vertikal'nymi ploskostyami v magnitnom pole)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 3, pp. 675-683 (USSR)

ABSTRACT: First the authors refer to earlier works dealing with the same subject among them one published by themselves (Ref.1). The generalization to the case of random position of the planes is more difficult than in the case of the steady problem and it can be carried out in the same way as G.Z. Gershuni in his study (Ref.6). First the equations for the perturbations are put down, the authors here investigating two-dimensional perturbations. Also a current function and a vector potential are introduced. The sign of the imaginary

Card 1/4

part of the frequency ω determines the behaviour of small perturbations. The authors then mention the differential equations for the amplitudes of the perturbations of velocity and temperature must disappear in the parallel boundary planes bounding the liquid; the corresponding boundary conditions are put down. The perturbations of the magnetic field need, in general, not disappear; as boundary conditions for the field serve the usual conditions on the separating surfaces of the media. Furthermore, two possible orientations of the constant external field are investigated: 1.-The constant homogenous external field is situated at right angles to the parallel planes and thus also to the vector of the velocity of the steady motion of the liquid. 2.-The external field has the same direction as the velocity. With longitudinal and also with transverse fields the amplitude of the vector potential of the perturbation of the field can be eliminated from the equations. The problem then reduces to the finding of the amplitudes of the current function and of temperature from the given equations of the problem and the boundary conditions pertaining to it.

On the Stability of Steady Convective Motion of an Electrically Conducting Liquid Between Parallel Vertical Planes in a Magnetic Field

SOV/56-34-3-21/55

This problem will have a solution only for certain values of the complex number ω. In the second chapter of this work the problem formed is solved by approximation according to the method by Galerkin, the course of computation being followed step by step. The results obtained are discussed separately for the case of a longitudinal and a transverse field. In the transverse case the critical wave number k_m decreases monotonously with increasing M i.e. with the magnetic field becoming stronger the wave length of the steady perturbations increases. Besides, the investigated steady motion is unstable also with regard to nonsteady perturbations when a transverse field is present. Such a instability appears at sufficiently great field strengths. A diagram shows the dependence of the critical wave number on the field strength. In the case of a longitudinal field the stability can be compensated only by steady perturbations with $\omega = 0$. A longitudinal field increases the stability of motion

Card 3/4

On the Stability of Steady Convective Motion of an Electrically Conducting Liquid Between Parallel Vertical Planes in a Magnetic Field SOV/56-34-3-21/55

much less than a transverse field. In a longitudinal field the critical wave number decreases monotonously with increasing field strength. The qualitative results obtained can be made more precise by their approximation method used. There are 2 figures, 1 table and 9 references, 4 of which are Soviet.

ASSOCIATION: Permskiy gosudarstvenny universitet (State University Perm), Permskiy gosudarstvennyy pedagogicheskiy institut (Perm State Pedagogic Institute)

SUBMITTED: September 19, 1957

Card 4/4

24(8)

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M. SOV/20-124-2-15/71

TITLE: A Closed Convective Boundary Layer (Zamknutyy konvektivnyy pogranichnyy sloy)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 2, pp 298-300 (USSR)

ABSTRACT: The present paper solves the problem of the closed convective boundary layer in a horizontal circular cylinder. The surface of the cylinder with a radius R is kept at the temperature $T_0 = \Theta \sin x$, where x denotes the coordinate along the circle and Θ a time-constant amplitude. The temperature assumed to be homogeneous in the core is considered to be the temperature of reference. The core is assumed to rotate as a solid at the rate $v_\varphi = \omega r$, where the angular velocity ω is required. The boundary layer equations (in disregard of the curvature of the layer and with introduction of dimensionless variables) are:

$$v_x \frac{\partial v_x}{\partial x} + v_y \frac{\partial v_x}{\partial y} = \frac{\partial^2 v_x}{\partial y^2} + G \sin x\, T$$

Card 1/3

A Closed Convective Boundary Layer SOV/20-124-2-15/71

$$v_x \frac{\partial T}{\partial x} = v_y \frac{\partial T}{\partial y} = \frac{1}{Pr} \frac{\partial^2 T}{\partial y^2} ; \quad \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} = 0 .$$

Here $G = g \beta \Theta R^3/\nu^2$ denotes the Grasskhof number and $Pr = \nu/\chi$ the Prandtl number. The velocity layer and the temperature layer are assumed to have the same thickness $\delta (\delta \ll 1)$. The temperature and the velocity on the surface of the cylinder and on the boundary layer against the core are assumed to satisfy the usual boundary conditions, besides which there is a number of additional conditions. Besides, temperature and velocity must, as function of x, satisfy the condition of cyclisity. The approximated solution of the above equations is set up in the form

$$v_x = \bar{\omega}(P_1 + P_2 \cos 2x + \beta P_3 \sin 2x), \quad T = Q_1 \sin x + \alpha Q_2 \cos x .$$

The functions written down above have the necessary periodicity with respect to x. The coefficients P and Q can be selected as polynomials of y in such a manner that they satisfy the above conditions. The polynomials are also explicitly written down.

Card 2/3