Interaction of an ion beam with ...

Result: oscillatory excitation at $u > V$, $V \gg V_{Ai}$. (B) Assumption: $kr_0 \ll 1$. (a) Neglecting the heat motion,

$$\frac{\nu}{\Omega} = l\frac{V}{2c}\left[\frac{\frac{\omega_H^2}{V_{Ai}^2(u-V)} + \frac{a_n^2}{2Vr_0^2}}{\frac{a_n^2}{Vr_0^2} - \frac{\omega_H^2 V^3}{2V_{Ai}^4 u^3}}\right]^{1/4}. \qquad (33)$$

holds for $V_{Ai} \gg V$. Result: Oscillatory excitation if

$r_0 < \sqrt{2}\alpha_n \frac{u}{\omega_H}\left(\frac{V_{Ai}}{V}\right)^2$ (D). (b) Considering the heat motion of the plasma particles, the following holds:

$$\frac{\mathrm{Im}\,\nu}{\Omega} = \sqrt{2}\frac{u-V}{c}\left[1 - \frac{1}{4}\frac{(u-V)^2}{\omega_H^2 r_0^2}\alpha_n^2\right], \qquad (35).$$

Card 5/9

Interaction of an ion beam with ...

Result: Oscillatory excitation if $r_0^2 > \frac{1}{4}\frac{(u-V)^2}{\omega_H^2}\alpha_n^2$ (E). (c) Assumptions as under (A) (c);

$$\nu = i\frac{\sqrt{\pi}}{4}\frac{\Omega_i^2}{\Omega_i^2}\frac{u-V}{s}\omega_H\left\{1+\frac{c^2(u-V)^2}{V^4}-\frac{c^2(u-V)}{V^3}\left(\frac{\alpha_n c}{\Omega_i r_0}\right)^2\right\}. \qquad (37).$$

Result: Im $\nu > 0$ with $u > V$, and $r_0 > \frac{\alpha_n c}{\Omega_i}\sqrt{\frac{V}{u-V}}$ (F). (4) Low-frequency oscillations, disturbances of magnetohydrodynamic waves ($\omega < \omega_{Hi}$) by an ion beam moving through an electron-ion plasma. (A) Assumptions: $\gamma_1 r_0 \gg 1$, $\gamma_3 r_0 \gg 1$. (a) Assumptions: neglecting thermal effects, $\frac{\Omega_i^2}{k^2c^2} \gg \frac{\omega_{Hi}^2}{\omega^2} \gg 1$, $\frac{\Omega^2}{k^2c^2} \gg 1$ and $n < n_i$ (G). Then,

Card 6/9

Interaction of an ion beam with ...

$$\omega = i\Omega \frac{V_{Ai}}{s}\left\{\left[1-\frac{i}{2kr_0}\sqrt{\frac{n}{n_i}}\right]\left(1-\frac{V_A^2}{u^2}\right)^{-1}\right\}^{1/3}. \qquad (39).$$

Result: Oscillatory excitation with $u > V$. (b) Considering the heat motion in the plasma, and $\frac{\Omega_e^2}{c^2k^2}\frac{V_A}{s} \ll 1$ (H)

$$\frac{\mathrm{Im}\,\omega}{k_0} = \frac{1}{\sqrt{\pi}}\frac{u^3}{u^3-V_A^3}\frac{\Omega_i^2}{\Omega_e^2}\left[1+\frac{1}{2kr_0}\right], \qquad (42).$$

Result: Oscillatory excitation, if $u > V_A$. (c) Assumptions as under (3)(A)(c):

$$\mathrm{Im}\,\omega' = \frac{\sqrt{\pi}}{2}kV_{Ai}\frac{u-V_A}{s}\frac{\Omega^2}{k^2c^2}. \qquad (44).$$

Card 7/9

Interaction of an ion beam with ...

Result: Oscillatory excitation if $u > V_A$. (B) Assumption: $k_1 r_0 < 1$. (a) Neglecting heat motion of particles. Then,

$$\operatorname{Im}\omega' = \frac{\Omega^2}{c^2}\frac{V_{Ai}(u-V)}{\omega_H}\left(\frac{kr_0}{a_n}\right), \qquad (45),$$

where $V = V_{Ai}\alpha_n/r_0$. Result: Oscillatory excitation if $u > V$. (b) Ion beam with thermally conditioned velocity scatter, interaction with "cold" plasma.

$$\operatorname{Im}\omega' = kV_{Ai}\frac{\sqrt{\pi}}{2}\frac{\Omega^2}{c^2k^2}\frac{u-V}{s}\frac{kr_0}{a_n}. \qquad (47).$$

Result: Oscillatory excitation if $u > V = V_{Ai}\alpha_n/kr_0$. The authors thank K. P. Stepanov and A. B. Kitsenkc for valuable advice. A. I. Akhiyezer, Ya. B. Faynberg, and G. V. Gordeyev are mentioned. There are 12 references: 10 Soviet-bloc and 2 non-Soviet-bloc.

Card 8/9

27165
S/057/61/031/009/005/019
B109/B138

Interaction of an ion beam with ...

ASSOCIATION: Institut fiziki AN Gruzinskoy SSR Tbilisi (Institute of Physics AS Gruzinskaya SSR Tbilisi)

SUBMITTED: September 10, 1960

Card 9/9

S/057/62/032/001/006/018
B104/B138

24.2120

AUTHORS: Pataraya, A. D., and Lominadze, D. G.

TITLE: Excitation of magnetohydrodynamic waves in an anisotropic plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 1, 1962, 44-47

TEXT: The study was carried out by applying external alternating currents. The anisotropic plasma was assumed to be in a constant external magnetic field $\vec{H}_0$ along the z-axis in the presence of external currents $\vec{j}_0$. Provided $\vec{j}_0$ is sufficiently small, the plasma equations of G. Chew et al. (Proc. Roy. Soc., 236, 112, 1956) can be linearized, and a Fourier transformation applied. The dispersion equation thus obtained from the determinant of the resulting system enables one to study the various types of waves which might be propagated in anisotropic plasmas. The following relation is derived for the emission intensity of magnetohydrodynamic and magnetoacoustic waves:

Card 1/3

Excitation of magnetohydrodynamic ...

$$P=8\pi^5\frac{u_0^2\omega_0^2}{c^2}\int\left\{\left|j_\perp\left(\frac{\omega_0}{u_1},\ \vartheta,\ \varphi\right)\right|^2\frac{\cos^2\varphi}{u_1^3}+\frac{u_2^2-3v_A^2\cos^2\vartheta}{u_2^2-u_3^2}\times\right.$$

$$\left.\times\left|j_\perp\left(\frac{\omega_0}{u_2},\ \vartheta,\ \varphi\right)\right|^2\frac{\sin^2\varphi}{u_2^3}+\frac{3v_A^2\cos^2\vartheta-u_3^2}{u_2^2-u_3^2}\left|j_\perp\left(\frac{\omega_0}{u_3},\ \vartheta,\ \varphi\right)\right|^2\frac{\sin^2\varphi}{u_3^3}\right\}d\Omega, \quad (8).$$

The first term denotes the intensity of Alfvén waves, while the second and third terms denote the emission intensity of fast and slow magneto-acoustic waves. $j_\perp(k,\vartheta,\varphi)$ is the Fourier component of the external field density in a plane perpendicular, to the magnetic field direction, φ is the angle between the plane, in which $\vec{j}_0$ and $\vec{H}_0$, and $\vec{k}$ and $\vec{H}_0$ lie, ω_0 is the frequency of the external alternating current, u_i are the phase velocities of the three wave types. Some special cases are finally examined. N. L. Tsintsadze is thanked for discussions. A. Akhiyezer and A. Sitenko (ZhETF, 35, 116, 1958) are mentioned. There are 3 references: 2 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: G. Chew, M. Goldberger, F. Low, Proc. Roy. Soc. 236, 112, 1956.

Card 2/3

31946
S/057/62/032/001/006/018
B104/B138

Excitation of magnetohydrodynamic ...

ASSOCIATION: Institut fiziki AN Gruzinskoy SSR (Institute of Physics of the AS Gruzinskaya SSR)

SUBMITTED: March 18, 1961

4

Card 3/3

LOMINADZE, D.G.; STEPANOV, K.N.

Induction of low-frequency oscillations in a magnetoactive plasma by a flux of charged particles. Zhur. tekh. fiz. 33 no.11:1311-1314 N '63. (MIRA 16:12)

1. Institut fiziki AN Gruzinskoy SSR i Fiziko-tekhnicheskiy institut AN UkrSSR.

L 13810-65 EWT(l)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2 Pz-6/
Po-4/Pab-10/Pi-4 IJP(c)/AEDC(b)/AFETR/AFWL/ASD(a)-5/SSD(b)/ASD(p)-3/SSD/RAEM(a)/
ESD(gs)/ESD(t) AT

ACCESSION NR: AP4046340 S/0057/64/034/010/1803/1806

AUTHOR: Lominadze, D. G. B

TITLE: Amplification of ion-cyclotron waves by an electron beam

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 34, no. 10, 1964, 1803-1806

TOPIC TAGS: ohmic plasma heating, plasma heating, ion cyclotron wave, ion cyclotron wave amplification, plasma oscillation amplification

ABSTRACT: Ion-cyclotron waves can be amplified by an electron beam. The energy of the directed motion of an electron beam can be transferred to the ions in the following way: The electron beam amplifies the oscillations of plasma at a frequency close to ion-cyclotron frequency. As a result, part of the kinetic energy of the beam transforms into the energy of the ion-cyclotron oscillations in plasma, i.e., ions are heated by an electron beam. In investigating the conditions for the most effective transfer of the energy of an electron beam to the ions, it was found that amplification of the ion-cyclotron waves by the electron beam takes place when the beam velocity is sufficiently high. With an increase of the linear plasma density N, the

Card 1/2

L 13810-65
ACCESSION NR: AP4046340

conditions for amplification worsen. As the amplifying frequency approaches ion-cyclotron frequency ($R \to \infty$) the amplification factor increases, approaching a value

$$\sqrt{N}\,\frac{\Omega_H}{v_0}$$

(v_0 - velocity of plasma electrons in relation to ions). Maximum amplification apparently will be at $R \gg N \sim 1$. In this case, the amplification factor is determined only by the magnetic field and velocity of the beam. Since the electron beam also loses its energy on excitation of longitudinal waves in plasma, the amplification of ion-cyclotron oscillations is possible only then when the build-up increment during excitation of longitudinal oscillations does not exceed the ion-cyclotron frequency. Orig. art. has: 16 formulas.

ASSOCIATION: none

SUBMITTED: 14Sep63 ATD PRESS: 3131 ENCL: 00

SUB CODE: NP NO REF SOV: 003 OTHER: 004

Card 2/2

L 10734-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2 Po-4/
Pi-4/Pz-6/Pab-24 IJP(c)/ASD(p)-3/ESD(gs)/ESD(t)/BSD/AFWL/ASD(a)-5/AFETR/SSD/ESD(c)/
AEDC(b)/RAEM(a)/ASD(d)/ESD(dp)/ASD(f)-2 AT

ACCESSION NR: AP4046342 S/0057/64/034/010/1817/1822

AUTHOR: Giorgadze, N.P.; Lominadze, D.G.; Makhan'kov, V.G.

TITLE: On the interaction of waves in a bounded plasma

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.10, 1964, 1817-1822

TOPIC TAGS: plasma, wave process, waveguide, perturbation, plasma oscillation

ABSTRACT: The interaction of E-waves, H-waves and Langmuir oscillations in a cylindrical plasma waveguide in the absence of an external field is discussed in the second order of perturbation theory. The motion of the ions and the thermal motions of the electrons are neglected. The system is described by Maxwell's equations and the hydrodynamic equations for the motion of the electrons, with the kinetic pressure and viscosity terms (collisions) omitted. The velocity, density and fields are expanded in powers of a perturbation parameter, and coefficients of like powers of the parameter in the equations of motion are equated to give the perturbation equations of successive orders. An inhomogeneous linear equation for the second order electric field is derived, in which the inhomogeneous term involves only first order quantities. This equation is expressed in cylindrical coordinates and is employed to

L 10734-65
ACCESSION NR: AP4046342

discuss the second order waves arising from the interaction of first order ones. It is found, in qualitative agreement with results of N.P.Giorgadze and N.L.Tsintsadze (Izv.VUZov,Radiofizika 7,262,1964), that a second order H-wave can arise only if there is a first order H-wave, and Langmuir oscillations are present. H-waves alone, however, can give rise to second order E-waves. Orig.art.has: 28 formulas.

ASSOCIATION: none

SUBMITTED: 23Feb63 ENCL: 00

SUB CODE: ME,EM NR REF SOV: 005 OTHER: 003

2/2

L 10745-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2 Po-4/
Pi-4/Pz-6/Pab-24 IJP(c)/SSD/AFETR/ESD(t)/ASD(p)-3/AEM(a)/ESD(gs) AT

ACCESSION NR: AP4046343 S/0057/64/034/010/1823/1834

AUTHOR: Lominadze, D.G.; Stepanov, K.N. B

TITLE: Excitation of low frequency longitudinal oscillations in a plasma in a magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.10, 1964, 1823-1834

TOPIC TAGS: magnetized plasma, plasma wave, plasma beam interaction, plasma oscillation generation.

ABSTRACT: The authors discuss the low frequency longitudinal oscillations of a plasma in a magnetic field, and in particular their excitation by drifting electrons and by streams of ions and electrons moving parallel to the applied field. The treatment is based on a dispersion equation published by K.N.Stepanov (ZhETF 35,1155, 1958). The solutions of the dispersion equation are discussed in detail before excitation of the waves is considered. Long and short wavelength oscillations are distinguished; the wavelength of the former greatly exceeds the electron Larmor radius, and that of the latter is of the order of the ion Larmor radius. The long wavelength oscillations are discussed in the case when the electron temperature greatly exceeds

1/3

the ion temperature and the phase velocity in the direction of the applied field is much greater than the ion thermal velocity and much less than the electron thermal velocity. The short wavelength oscillations are discussed for all values of the ratio of the ion to the electron temperature, but for propagation nearly normally to the applied field so that the phase velocity in the direction of the field is much less than the electron thermal velocity. These oscillations include those at frequencies near the ion Larmor frequency, mentioned by W.E.Drummond and M.N.Rosenbluth (Phys.Fl.5,1507,1962). Oscillations of all the types discussed can be excited by the drift of electrons due to an external electric field or by streams of ions and electrons moving parallel to the magnetic field, provided the drift velocity or the stream velocity exceeds the phase velocity of the waves. The excitation of the waves by this mechanism is discussed in detail, and formulas for the logarithmic increments are derived for a variety of special conditions as regards the density, temperature and velocity of the stream. "In conclusion, the authors express their deep gratitude to A.I.Akhiyezer for suggesting the problem, for his interest in the work and for advice." Orig.art.has: 117 formulas, 3 figures and 1 table.

L 10745-65
ACCESSION NR: AP4046343

0

ASSOCIATION: none

ENCL: 00

SUBMITTED: 09Apr64

OTHER: 001

SUB CODE: ME,EM

NR REF SOV: 004

3/3

L 26977-65 EWT(l)/EPA(sp)-2/T/EEC(t)/EPA(w)-2/EWA(m)-2 Pz-6/Pc-4/Pab-10/Pi-4
IJP(c) AT
ACCESSION NR: AP5003250 S/0057/65/035/001/0148/0151

65
34
B

AUTHOR: Lominadze, D.G./ Stepanov, K.N.

TITLE: On the excitation of magnetoacoustic waves in colliding plasma streams 21

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.1, 1965, 148-151

TOPIC TAGS: plasma, plasma stability, plasma interaction, magnetic sound wave, dispersion relation, mathematical physics

ABSTRACT: The stability against low-frequency long-wavelength oscillations of two interpenetrating plasma streams moving in opposite directions parallel to a magnetic field is discussed theoretically. The temperatures of the two streams are assumed to be the same, and the electron temperature is assumed greatly to exceed the ion temperature. The dispersion equation is written for waves for which the frequency is low compared with the ion Larmor frequency, the wavelength is considerably greater than the electron and ion Larmor radii, and the component of the phase velocity parallel to the magnetic field is low compared with the electron and high compared with the ion thermal velocity. The antihermitian part of the dielectric tensor, describing Cerenkov absorption and radiation, is neglected. The roots of

Card 1/2

L 26977-65

ACCESSION NR: AP5003250

2

this dispersion equation are discussed and the region of stability was calculated numerically and is presented graphically in terms of coordinates representing essentially the relative velocity of the two streams and the strength of the magnetic field. The effect of Cerenkov absorption and radiation on the stability region is discussed briefly. Orig.art.has: 11 formulas and 2 figures.

ASSOCIATION: Institut fiziki AN Gruz.SSR,Tbilisi (Institute of Physics, AN Georgian SSR); Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov (Physicotechnical Institute AN UkrSSR)

SUBMITTED: 12May64 ENCL: 00 SUB CODE: ME,EM

NR REF SOV: 003 OTHER: 000

Card 2/2

L 33167-65 EPA(w)-2/EWT(1)/EEC(t)/EPA(sp)-2/T/EWA(m)-2 Pi-4/Po-4/Pz-6/Pab-10
ACCESSION NR: AP5005219 S/0057/65/035/002/0205/0211

AUTHOR: Loninadze, D.G.; Stepanov, K.N. 34 34B

TITLE: On the stability of two colliding plasma streams in a magnetic field 21

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.2, 1965, 205-211

TOPIC TAGS: plasma stability, plasma interaction, plasma heating, plasma beam instability, magnetic field

ABSTRACT: The authors discuss the stability of two plasma streamsof equal density and temperatures moving through each other in opposite directions parallel to an external magnetic field. The following cases are treated separately: 1) low-frequency longitudinal oscillations when the magnetic pressure is large compared with the kinetic, the electron thermal velocity is large compared with the stream velocity, and the ion thermal velocity is negligible; 2) high-frequency longitudinal oscillations when the thermal velocities of both the electrons and ions are small compared with the stream velocity; and 3) oscillations that occur when the ion temperature is high. In each case the requisite dispersion equation is either quoted from earlier work (A.B.Kitsenko and K.N.Stepanov, ZhTF 32,303,1962) or written

Card 1/2

L 33167-65
ACCESSION NR: AP5005219

3

without derivation or reference. The behavior of the dispersion equation is illustrated graphically in each case, the stability conditions are derived, and equations are derived for the growth constants (logarithmic increments) near the stability boundaries. The instability found in case 1) when the stream velocity is large compared with the velocity of sound could be employed to heat the ion component of a plasma, the electron component of which had been previously raised to a high temperature. The growth constant of the oscillations in case 3) is small, but these oscillations may still be important in interacting plasma streams because the ions carry the major portion of the stream energy. "In conclusion, the authors express their gratitude to A.I.Akhiyezer for discussing the results and for valuable advice." Orig.art.has: 21 formulas and 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR,Khar'kov(Physicotechnical Institute, AN UkrSSR);Instituto fiziki AN GSSR Tiflis (Institute of Physics, AN GSSR)

SUBMITTED: 04May64 ENCL: 00 SUB CODE: ME,EM

NR REF SOV: 004 OTHER: 000

Card 2/2

L 40940-65 EPF(n)-2/EPA(w)-2/EWT(1)/EWG(m) Po-4/Pi-4/Pz-6/Peb-10 IJP(c) AT/

ACCESSION NR: AP5007288 S/0057/65/035/003/0441/0448

AUTHOR: Lominadze, D.G.; Stepanov, K.N. 21

TITLE: Excitation of oscillations in a plasma by a flux of oscillators

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.3, 1965 441-448

TOPIC TAGS: plasma beam interaction, plasma electromagnetic wave, plasma instability, ion stream, adiabatic trap

ABSTRACT: The authors discuss the excitation in a plasma of oscillations propagating nearly perpendicularly to an external magnetic field by a stream of ions, all of which have the same Larmor radius. These ions are the "oscillators" of the title. Those oscillations of the plasma are considered for which the wavelength is short compared with the Larmor radius of the exciting ions and the frequency is high compared with their Larmor frequency. The contribution of the ion beam to the dielectric tensor is taken from work of A.B.Kitsenko and K.N.Stepanov (Ukr.fiz.zhurn.6, 297,1961) in the form of an infinite series of Bessel functions whose arguments are the large ratio of the Larmor radius to the wavelength. The dielectric tensor is accordingly transformed to a form that converges more rapidly under the conditions

Card 1/2

L 409[illegible]-65

ACCESSION NR: AP5007288

2

of the present problem, and the roots of the dispersion equation are discussed for ordinary, extraordinary and longitudinal waves. The dispersion equation has roots not only at frequencies near harmonics of the electron Larmor frequency and the hybrid frequency, but also at a frequency close to the ratio of the ion beam velocity to the wavelength. The logarithmic increment of the longitudinal waves is much greater than that of the transverse waves; it is proportional to $(n'/n)^{2/5}$, where n' and n are the particle densities of the ion beam and the plasma, respectively. If the plasma contains no ions except those of the beam, it is unstable under all conditions. Instability of this type may be expected to arise in high density adiabatic magnetic mirror systems in which the ion velocity distribution is highly anisotropic. "In conclusion, the authors express their gratitude to V.F.Aleksin for valuable advice and discussions." Orig.art.has: 46 formulas.

ASSOCIATION: Institut fiziki AN Gruz.SSR,Tbilisi (Institute of Physics, AN Grus. SSR); Fiziko-tekhnicheskiy institut AN UkrSSR,Khar'kov (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 26Jun64 ENCL: 00 SUB CODE: ME

NR REF SOV: 005 OTHER: 001

Card 2/2

L 40941-65 EPF(n)-2/EPA(w)-2/EWT(l)/EWG(m) Pi-4/Po-4/Pz-6/Pab-10 IJP(c) AT/
WW

ACCESSION NR: AP5007289 S/0057/65/035/003/0449/0458

AUTHOR: Lominadze, D.G.; Stepanov, K.N. 52 50 B 41

TITLE: Excitation of low frequency longitudinal oscillations in a plasma by a stream of charged particles with an anisotropic distribution function

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.3, 1965, 449-458

TOPIC TAGS: plasma beam interaction, plasma stability, ion stream

ABSTRACT: The authors discuss the excitation of low frequency longitudinal oscillations of a plasma in the presence of an external magnetic field by a stream of charged particles having a delta-function distribution of velocity components perpendicular to the magnetic field and a Maxwellian distribution of the velocity component parallel to the field. The dispersion equation is written without derivation or reference, and its solutions are discussed at considerable length. Long wavelength oscillations occur with phase velocities much greater than the thermal velocities of the plasma particles and, in the case of a highly anisothermal plasma, with phase velocity intermediate between the ion and electron thermal velocities.

Card1/2

L 40941-65
ACCESSION NR: AP5007289

2

Longitudinal ionic cyclotron waves with wavelength of the order of the plasma ion Larmor radius propagate nearly at right angles to the magnetic field. The excitation of longitudinal oscillations is discussed separately for the case of a hot beam (broad distribution of the velocity component parallel to the magnetic field), and for that of a cold beam. Formulas are derived for the logarithmic decrement (or increment) of the various waves, and the conditions for the stability of the system are discussed. Orig.art.has: 73 formulas.

ASSOCIATION: Institut fiziki AN Gruz.SSR,Tbilisi (Institute of Physics, AN Gruz. SSR); Fiziko-tekhnicheskiy Institut UkrSSR, Khar'kov(Physicotechnical Institute, UkrSSR)

SUBMITTED: 26Jun64 / ENCL: 00 SUB CODE: ME

NR REF SOV: 003 OTHER: 001

Card 2/2 pb

L 34936-65 EWT(1)/EPA(w)-2/EEC(t) Pab-10

ACCESSION NR: AP5007309 S/0057/65/035/003/0568/0571

AUTHOR: Lominadze, D.G. 31 32 B

TITLE: Cerenkov radiation of a ring current in a Brillouin cloud

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.3, 1965, 568-571

TOPIC TAGS: electron beam, electron waveguide, magnetic field, Cerenkov radiation, radiation 21

ABSTRACT: The author discusses the excitation of an axially symmetric Brillouin electron cloud (L.Brillouin, Phys.Rev.67,260,1945) by an infinitely thin current ring moving with uniform velocity perpendicular to its plane and parallel to the magnetic field. The dispersion equation derived for the Brillouin beam differs from that obtained by B.N.Rutkevich and Ya.B.Faynberg (ZhTF 29,280,1959) without taking into account the surface current. The azimuthal electric field excited by the motion of the current ring is calculated, as well as the power loss due to the interaction of the current ring with this field. It is found that no power is radiated at frequencies exceeding the Langmuir frequency of the Brillouin cloud or at a certain critical frequency (less than the Langmuir frequency) which depends on the

Card 1/2

L 34936-65
ACCESSION NR: AP5007309

radius of the current ring. Expressions are derived for the limiting form of the radiated field and the power as the frequency approaches the Langmuir frequency. "In conclusion, I express my gratitude to Ya.B.Faynberg for suggesting the topic and for discussions, and to V.I.Kurilko for his assistance and his constant interest in the work." Orig.art.has: 23 formulas. [02]

ASSOCIATION: Institut fiziki AN Gruz.SSR, Tiflis (Institute of Physics, AN GruzSSR)

SUBMITTED: 24Jun64 ENCL: 00 SUB CODE: NP,EM

NO REF SOV: 006 OTHER: 003 ATD PRESS: 3211

Card 2/2

L 44809-65 EWT(1)/EPF(n)-2/EWG(m)/EPA(w)-2 Po-4/Pr-6/Pab-10/Pi-4
(t/p) AT/WW

ACCESSION NR: AP5012051 UR/0057/65/035/005/0865/0874

AUTHOR: Lominadze, D.G.; Shevchenko, V.I.

TITLE: On the nonlinear theory of low-frequency oscillations excited in a plasma by an ion beam

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 5, 1965, 865-874

TOPIC TAGS: plasma beam interaction, nonlinear system, plasma heating, plasma instability, plasma wave, ion temperature, ion beam, plasma

ABSTRACT: V.D.Shapiro and K.N.Stepanov, separately and in collaboration with one or the other of the present authors, have discussed the excitation of oscillations in a plasma by charged particle beams (ZhETF, 42, 1515, 1962; 44, 613, 1963; ZhTF, 34, 1823, 1964). The present paper presents a continuation of this earlier work. The authors discuss the excitation of long-wavelength low-frequency oscillations in a plasma by an ion beam in the presence of a magnetic field, and also the excitation of longitudinal oscillations at harmonics of the ion Larmor frequency. The initial stage of the developing instability, in which the ion beam remains essentially monoenergetic, is treated in a hydrodynamic approximation in which the system is

Card 1/2

L 44809-65

ACCESSION NR: AP5012051

described by the moments of the distribution functions. The later stages, in which a considerable velocity dispersion develops in the ion beam, are treated in a quasi-linear approximation. The exposition rests heavily on the earlier work. The energy loss of the ion beam is calculated, and it is found that a considerable fraction of the energy lost by the beam can appear as thermal energy of the plasma ions. "The authors express their gratitude to Ya.B.Faynberg and V.D.Shapiro for suggesting the problem and for assistance with the work." Orig. art. has: 49 formulas.

[02]

ASSOCIATION: none

SUBMITTED: 16Jul64 ENCL: 00 SUB CODE: ME, NP

NO REF SOV: 004 OTHER: 001 ATD PRESS: 3257

Card 2/2

L 04750-67 EWT(1) IJP(c) AT/GD

ACC NR: AT6020446 (N) SOURCE CODE: UR/0000/65/000/000/0155/0167

AUTHOR: Lominadze, D. G.; Stepanov, K. N.

ORG: none

TITLE: Excitation of longitudinal low frequency oscillations of a plasma by a charged particle beam with anisotropic distribution functions

SOURCE: AN UkrSSR. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy (Interaction of charged particle beams with plasma). Kiev, Naukova dumka, 1965, 155-167

TOPIC TAGS: plasma magnetic field, dispersion equation, longitudinal magnetic field, particle beam

ABSTRACT: The excitation of low-frequency electron-ion longitudinal waves in a plasma by a beam of oscillators (i. e., a beam consisting of particles with an identical gyroradius) in a longitudinal magnetic field is investigated. The plasma is assumed to have Maxwellian distribution while the beam has a similar distribution for its longitudinal velocity. The transverse velocity of the beam is taken to be a delta function. The dispersion relation for the longitudinal wave is used to investigate the damping coefficients of various waves. A detailed analysis of the "hot" beam and "cold" beam is made. The criteria specifying the point at which the beam satisfies the above designations are established. In the case of the hot beam, only a small fraction of the

Card 1/2

L 04750-67
ACC NR: AT6020446

beam particles contribute both to the excitation and absorption coefficients. The latter are explicitly derived. In the case of the cold beam, a similar analysis in which the problem was broken down into several subcases was made. At very low temperature, all particles were found to contribute to excitation; maximum increase in excitations occurred at particle resonance. Orig. art. has: 64 formulas.

SUB CODE: 20/ SUBM DATE: 11Nov65/ ORIG REF: 003/ OTH REF: 001

Card 2/2 dB

L 04834-67 EWT(1) LJP(c) GD/AT
ACC NR: AT6020449 (N) SOURCE CODE: UR/0000/65/000/000/0182/0186

AUTHOR: Laminadze, D. G.

27
Bi

ORG: none

TITLE: Cerenkov radiation of a ring current in a Brillouin cloud

SOURCE: AN UkrSSR. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy (Interaction of charged particle beams with plasma). Kiev, Naukova dumka, 1965, 182-186

TOPIC TAGS: Brillouin zone, Cerenkov radiation, Fourier series, motion equation

ABSTRACT: The oscillations in electron beams with an uncompensated space charge in a Brillouin regime is investigated in order to establish energy losses by Cerenkov radiation. The beams considered here are infinitely thin rings, idealizing systems which can be considered for accelerators and focusing schemes; the electrons move along the waveguide surface. The equations of motion for a static case of a Brillouin cloud are extended to include the high-frequency effects of the excitations, which are applied as an impulse. The homogeneous system of equations is a Fourier system analyzed subject to the appropriate boundary conditions. It is noted that E-waves are excited. These have identical dispersion relations with those of the electromagnetic oscillations in a plasma column without the magnetic field allowing the author to apply the results of Ya. B. Faynberg, et al, 1961 to this work. It is further shown that in the electrostat-

Card 1/2

L 04834-67
ACC NR: AT6020449

ic approximation, the energy loss tends toward zero. In the more general case, the losses occur only at resonance. Orig. art. has: 16 formulas.

SUB CODE: 20/ SUBM DATE: 11Nov65/ ORIG REF: 003/ OTH REF: 004

Card 2/2 afs

L 04835-67 EWT(1) IJP(c) WW/AT/GD
ACC NR: AT6020448 (N) SOURCE CODE: UR/0000/65/000/000/0177/0181

AUTHOR: Lominadze, D. G.; Stepanov, K. N.

ORG: none

TITLE: Excitation of magnetosonic waves in colliding plasma beams

SOURCE: AN UkrSSR. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy (Interaction of charged particle beams with plasma). Kiev, Naukova dumka, 1965, 177-181

TOPIC TAGS: MHD shock wave, plasma beam interaction, dispersion equation

ABSTRACT: The stability of two identical plasma streams moving along a static magnetic field in opposite directions is investigated in the region intersected by the streams. It is assumed that the streams are characterized by an electron temperature higher than that of the ions. The dispersion relation for the magnetosonic waves is written and immediately simplified by the elimination of small anti-hermitian factors, using, in effect, hydrodynamic approximation. The equations hold for low-frequency oscillations with the phase velocity of the waves being much smaller than the thermal electron velocity but greater than the thermal ion velocity. When beam velocity exceeds the Alfven velocity, transverse Alfven waves are excited; however, when acoustic velocity exceeds beam velocity, acoustic waves are generated. An expression relating these velocities is derived giving the region in which beam instability also develops. It is also shown

Card 1/2

L 04835-67
ACC NR: AT6020448

that more complete treatment of the problem predicts wave growth in the region where there is no instability. However, the rate of wave growth is slight. Orig. art. has: 5 formulas, 3 figures.

SUB CODE: .20/ SUBM DATE: 11Nov65/ ORIG REF: 003

Card 2/2 afs

L 04836-67 EWT(1) IJP(c) AT/GD
ACC NR: AT6020447 (N) SOURCE CODE: UR/0000/65/000/000/0167/0177

AUTHOR: Lominadze, D. G.; Stepanov, K. N.

ORG: none

52
B+1

TITLE: Excitation of plasma oscillations by a beam of oscillators

SOURCE: AN UkrSSR. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy (Interaction of charged particle beams with plasma). Kiev, Naukova dumka, 1965, 167-177

TOPIC TAGS: plasma oscillation, Larmor radius, plasma wave, plasma density

ABSTRACT: Excitation of plasma waves moving normally to an external magnetic field by a beam of ions with identical Larmor radius (beam of oscillators) is investigated. The problem under consideration is limited to short wavelength excitations (much shorter than the Larmor radius). Growth rate and frequency of the wave are taken to be much greater than the gyrofrequency of the ions. This permits one to view the ions as moving effectively in a direction perpendicular to the external field. The contribution of the beam to the dielectric tensor of the plasma is described and the sums of each of the elements is rewritten in terms of suitable integrals. This leads to a simplified expression for the elements in terms of wavelengths, which in turn yields the dispersion relations. The latter are characterized by the presence of a resonance factor. The presence of ordinary and extraordinary waves is further derived and the special

Card 1/2

L 04836-67
ACC NR: AT6020447

cases of propagation parallel and perpendicular to the field are analyzed and the dielectric coefficients obtained. The rate of growth of both waves is shown to be comparable when the longitudinal and transverse ion velocities are the same and the plasma density is high. It is also shown that in dense plasma, instabilities form when the product of normal ion velocity and wave vector is equal to the hybrid frequency. This case corresponds to plasmas in magnetic adiabatic traps containing ions whose distribution function is strongly anisotropic. Orig. art. has: 40 formulas.

SUB CODE: 20/ SUBM DATE: 11Nov65/ ORIG REF: 005/ OTH REF: 001

Card 2/2 afs

L 07403-67 EWT(1) IJP(c) GD/AT
ACC NR: AT6020580 (N) SOURCE CODE: UR/0000/65/000/000/0164/0177

AUTHOR: Lominadze, D. G.; Shevchenko, V. I. 49 B+/

ORG: none

TITLE: On the nonlinear theory of low frequency oscillations excited by an ion beam in a plasma

SOURCE: AN UkrSSR. Vysokochastotnyye svoystva plazmy (High frequency properties of plasma). Kiev, Naukovo dumka, 1965, 164-177

TOPIC TAGS: plasma oscillation, plasma beam interaction

ABSTRACT: The possibility of heating the ion component of a plasma by beam instabilities is investigated in the nonlinear approximation for the case of plasma with electron temperature much higher than that of the ions. The first phase of development of the instability is traced out and most unstable branches of the oscillation are determined. Three regimes, namely, excitation of long wavelength, high frequency oscillations (hydrodynamic phase), excitation of low frequency oscillations (quasi-linear phase) and short wavelength, and low frequency waves are investigated in detail. The change in macroscopic plasma and beam parameters (thermal energy, directed velocity) are derived. It is possible to describe the development of the instability during the quasilinear phase and determine the state reached by the plasma and the beam as a result of quasilinear relaxation when a strong magnetic field is superimposed on the

Card 1/2

L 07803-67

ACC NR: AT6020580

plasma. In general, it is found that the beam energy is shifted to transverse energy and leads to enhanced diffusion of ions across magnetic field lines. Orig. art. has: 45 formulas.

SUB CODE: 20/ SUBM DATE: 19Nov65/ ORIG REF: 003/ OTH REF: 001

Card 2/2

[redacted], . . .

Dissertation: "Deep leafy forests of the Georgian SSR." Cand Ag[ric] Sci, Georgian Agricultural Inst, 20 Apr 54. (Zarya Vostoka, Tbilisi, 6 Apr 54)

SC: SUM 243, 19 Oct 1954

[redacted]

[redacted]

[redacted]

LOMINADZE, T.A.

Some problems of the ecology of the representatives of the family Macrocephalitidae. Soob. Gruz. SSR 34 no.2:387-394 My '64. (MIRA 18:2)

1. Institut paleobiologii AN Gruzinskoy SSR, Tbilisi. Submitted July 10, 1963.

LOMINADZE, T.A.

Characteristics of the suture of macrocephalitids. Soob. AN Gruz. SSR 36 no.1:[illegible] 0 '64. (MIRA 17:3)

1. Institut paleobiologii AN Gruzinskoy SSR. Submitted April 11, 1964.

RAZMADZE, Sh.M.; LOMINADZE, V., spets.red.; GOGESHVILI, E., red.izd-va; SAGARADZE, Sh., tekhn.red.

[Electromagnetic processes in systems with large converting devices] Elektromagnitnye protsessy v sistemakh s moshchnymi preobrazovatel'nymi ustanovkami. Tbilisi, Izd-vo Gruzinskogo politekhn.in-ta im. V.I.Lenina, 1960. 275 p. (MIRA 14:4)

(Electric current rectifiers)

RAZMADZE, Sh.M.; LOMIDADZE, V., red.; GOGESHVILI, N., red.izd-va; KATSITADZE, A., tekhn. red.

[Three-phase current rectification] Vypriamlenie trekhfaznogo toka. Tbilisi, Gos.izd-vo "TSodna" M-va kul'tury Gruzinskoi SSR, 1963. 255 p. (MIRA 16:12)
(Electric current rectifiers)

LOMINADZE, V.G., kand.tekhn.nauk (Tbilisi); CHKHIKVADZE, Yu.I., kand. tekhn.nauk (Tbilisi)

Special features in the design of three-phase asynchronous braking motors with tapered rotors. Elektrichestvo no.3:46-50 Mr '62. (MIRA 15:2)

(Electric motors, Induction)

LOMINADZE, V.G., kand.tekhn.nauk, dotsent (Tbilisi); CHKHIKVADZE, Yu.I., kand.tekhn.nauk (Tbilisi)

Calculation of the axial force of an asynchronous motor with tapered rotor under unbalanced rotor conditions. Elektrichestvo no.4:27-31 Ap '63. (MIRA 16:5)
(Electric motors, Induction)

L 02317-67 EWT(1)
ACC NR: AR6016570 SOURCE CODE: UR/0196/65/000/012/1017/1017

40
B

AUTHOR: Lominadze, V. G.

TITLE: Analysis of transition processes in asymmetric a-c machines 29

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 121113

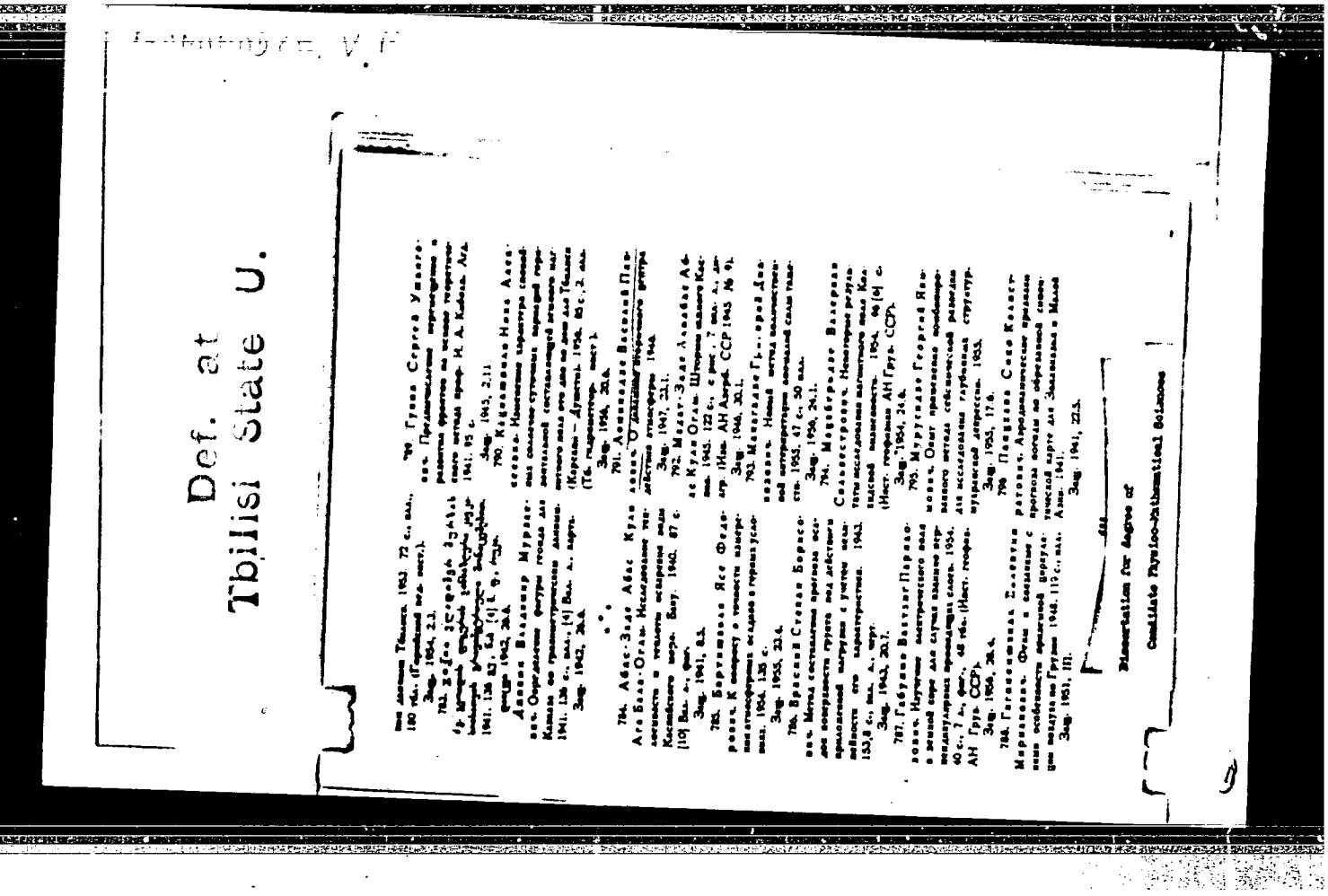
REF SOURCE: Tr. Gruz. politekhn. in-t, no. 2(100), 1965, 151-157

TOPIC TAGS: electric equipment, electric motor, motor generator

ABSTRACT: As a method for analyzing transition processes in asymmetric machines, the author proposes conversion of an asymmetric synchronous machine to a "hypothetical" symmetric machine which is equivalent to the actual asymmetric machine with respect to balance of both active and wattless power. A method is given for finding this "hypothetical" machine. 2 illustrations, bibliography of 7 titles. F. Goryainov. [Translation of abstract]

SUB CODE: 09

Card 1/1 UDC: 621.313.32.001.4



Def. at
Tbilisi State U.

Dissertation for degree of
Candidate Physico-Mathematical Sciences

84584

3,5000

S/169/60/000/009/002/007
A005/A001

Translation from: Referativnyy zhurnal, Geofizika, 1960, No. 9, p. 137, # 11055

AUTHORS: Lominadze, V.P., Napetvaridze, Ye.A.

TITLE: The Aerosynoptic Conditions of Turtulent Currents in the Atmosphere Producing Bumping of Aircraft at the Suknumi - Tbilisi - Yerevan Route

PERIODICAL: Tr. Tbilissk. n.-i. gidrometeorol. in-ta, 1959, No. 4, pp. 112-123

TEXT: The authors analyzed the aerometeorologic materials and consider the fundamental synoptic processes characteristic for the Trans-Caucasus and the turbulence and bumping of aircraft of various intensity, which are connected with the processes. Four fundamental types of the synoptic processes are distinguished: I. Invasions of cold air from the West due to the development of cyclones over the European territory of the USSR, and the rear high pressure crest connected with them. Such processes are observed in all seasons of the year. The thermobaric field is characterized by the existence of a frontal zone in the upper air having its confluence over the Black Sea, which causes also the invasions of cold air

Card 1/3

84584

S/169/60/000/009/002/007
A005/A001

The Aerosynoptic Conditions of Turbulent Currents in the Atmosphere Producing Bumping of Aircraft at the Sukhumi - Tbilisi - Yerevan Route

from the West. The increase in turbulence is most probable when the processes of the considered type develop intensely; in connection with that the authors estimated the possibilities of bumping in the various route sections. II. Invasions from the East which are observed predominantly in the cold season of year and are connected with the orographic convergence of air currents over the Caspian Sea. The frontal zone in the upper air is located over the eastern regions of the Caucasus and the southern Caspian Sea. Enhanced turbulence is observed over the Suramskiy Pass and westward of Tbilisi. III. The anticyclonic state which appears after cessation of the invasions from the West and East and represents mainly the concluding stage of the processes I and II. It is characterized by a considerably lesser turbulence, but favorable conditions for its development arise near the mountain slopes. IV. The wave activity at the front located in the southern region of the Trans-Caucasus which is most effective in the warm season of year. The processes of this type give rise the highest, after type I, recurrence of bumping. - The weather conditions and the characteristics of re-

Card 2/3

84584

S/169/60/000/009/002/007
A005/A001

The Aerosynoptic Conditions of Turbulent Currents in the Atmosphere Producing Bumping of Aircraft at the Sukhumi - Tbilisi - Yerevan Route

currence and intensity of bumping of aircraft with respect to the seasons and route sections are described briefly for all four types of processes. Information is given about the altitude and thickness of the bumping layer, the horizontal extension of the turbulence zones, and the dependence of bumping on the velocity and direction of the wind along the route.

Ye.F. Chugunov

Translator's note: This is the full translation of the original Russian abstract.

Card 3/3

LOMINADZE, V.P.

Brief results of scientific activities of the Tiflis Hydrometeorological Scientific Research Institute during 1953-1958. Trudy Tbil.NIGMI no.5:3-10 '59. (MIRA 13:6)
(Georgia--Meteorological research)

SOV/50-59-5-10/22

3(7)

AUTHORS: Lominadze, V. I. Director of the Institute; Bartishvili, I. T., Secretary of the Party Office; Bitskinashvili, L. Z., Chairman of the MK; Matveyev, V. M., Chief of the Airport; Omadze, G. Ya., Deputy Chief of the Political Department; Kolesnikov, M. E., Secretary of the Party Office; Tupalov, D. T., Chairman of the MK; Tskhvitava, K. V., Chief of the AMSG; Petrov, V. S., Commander of the Aircraft TU-104

TITLE: A Useful Enterprise (Poleznoye nachinaniye)

PERIODICAL: Meteorologiya i gidrologiya, 1959, Nr 5, pp 44 - 45 (USSR)

ABSTRACT: The Collective of the Tbilisskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut (Tbilisi Hydrometeorological Scientific Research Institute) established a collaboration with the workers of the airport. An appeal to the workers of the AMSG (Air Weather Station of the Civil Air Fleet) and the flying and ground personnel of the airport, as well as the obligations of the personnel of Tbilisi Airport and of the workers of the AMSG, are published here. The appeal requests to give lectures and reports on physical conditions of the atmosphere. The atmospheric processes most influencing aviation are to be explained. A

Card 1/2

A Useful Enterprise

scientific discussion and analysis of complicated meteorological conditions in aviation are to be organized. Systematic reports on the latest achievements inland and abroad are to be delivered. The members of the personnel taking part in correspondence lessons of universities are to receive help and advice in physics, mathematics, aerodynamics and meteorology. The personnel of Tbilisi Airport and the workers of the AMSG agree: 1) To carry out careful meteorological observations throughout every flight, and communicate them in due time to the AMSG. 2) The workers of the AMSG agree to collect systematically the material of meteorological observations, and to inform the TbilNIGMI in due time. 3) The airplane crews agree to support as much as possible the scientific co-workers during the flight. 4) The airplane crews agree to discuss any complicated case of meteorological conditions arising during the flight, in the presence of the co-workers of the TbilNIGMI. 5) The workers of the airport are to deliver lectures on jet and piston-engine propelled aircraft for the co-workers of the TbilNIGMI.

Card 2/2

GUNIYA, S.U.; LOMINADZE, V.P., otv.red.; USHAKOVA, T.V., red.; VOLKOV, M.V., tekhn.red.; BRATNINA, M.I., tekhn.red.

[Thunderstorm processes in Transcaucasia] Grozovye protsessy v usloviiakh Zakavkaz'ia. Leningrad, Gidrometeor.izd-vo, 1960. 155 p. (MIRA 13:10)

(Transcaucasia--Thunderstorms)

LOMINADZE, V.P., dotsent

Introductory address. Trudy Tbil.NIGMI no.9:6-7 '61.
(MIRA 15:3)
1. Tbilisskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut.
(Caucasus—Glaciological research—Congresses)

LEZHAVA, G.P.; LOMINADZE, V.P.

Development of hydrometeorological service and science in the 40 years of Soviet Georgia. Trudy Tbil. NIGMI no.10: 3-9 '62. (MIRA 16:11)

S/169/62/000/009/090/120
D228/D307

AUTHOR: Lominadze, V. P.

TITLE: Relation between types of synoptic process and turbulence in the upper troposphere over Transcaucasia

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 9, 1962, 70, abstract 9B427 (Tr. Tbilissk. n.-i. gidrometeorol. in-ta, no. 10, 1962, 113-116)

TEXT: The article considers the relation between turbulence of differing intensity in the upper troposphere and the main synoptic processes in Transcaucasia. It is established on the basis of the aerosynoptic analysis of numerous flights in the upper troposphere above Transcaucasia that the frequency of aircraft bumping is maximal during the Type I synoptic process and minimal during Type IV. [Abstracter's note: Complete translation.]

Card 1/1

PAPINASHVILI, K.I.; LOMINADZE, V.P., red.; VAYTSMAN, A.I., red.; NIKOLAYEVA, G.S., tekhn.red.

[Atmospheric processes in Transcaucasia and their connection with large-scale circulation processes above Eurasia] Atmosfernye protsessy v Zakavkaz'e i ikh svyaz' s makrotsirkuliatsionnymi protsessami nad Evraziei. Leningrad, Gidrometeoizdat, 1963. 183 p. (MIRA 16:8)
(Eurasia--Atmosphere) (Transcaucasia--Atmosphere)

BELYAYEV, V.P.; BELTADZE, T.G.; LITOVCHENKO, V.P.; LITVINOVA, V.D.; LOMINADZE, V.P.; PINUS, N.Z.; SOFIYEV, Ye.M.; SHUR, G.N.

Some results of experimental investigations of atmospheric turbulence using radiosondes. Trudy TSAO no.54:4-52 '64. (MIRA 17:6)

ACCESSION NR: AT4038390 S/2789/64/000/054/0004/0052

AUTHOR: Belyayev, V. P.; Beltadze, T. G.; Litovchenko, V. P.; Litvinova, V. D.; Lominadze, V. P.; Pinus, N. Z.; Sofiyev, Ye. M.; Shur, G. N.

TITLE: Some results of experimental studies of atmospheric turbulence by means of radiosondes

SOURCE: Tsentral'naya aerologicheskaya observatoriya. Trudy*, no. 54, 1964. Atmosfernaya turbulentnost' (Atmospheric turbulence), 4-52

TOPIC TAGS: meteorology, atmospheric turbulence, radiosonde, air route turbulence

ABSTRACT: A description is given of methods and equipment for measuring air turbulence over Moscow, Sukhumi (Caucasus), and Tashkent (Kazakhstan). One of the noteworthy features of the method is the synchronization of measurements of air turbulence with

Card 1/3

ACCESSION NR: AT4038390

such parameters as air temperature, humidity, pressure, wind velocity and wind direction. Turbulence was measured mostly by balloon-borne radiosondes with an A-22-III accelerometer attached. Sufficient data have been collected (457 radiosonde ascents in 1961—62) to determine a turbulence pattern over the aforementioned localities. Turbulence occurs with the highest frequency in the 1—2 km ground layer, it then decreases reaching a minimum at 6—7 km and then reaches a maximum again at 10—12 km. Data were analyzed to determine other turbulence characteristics depending on location, season, altitude, etc. It was noted that turbulence generally depends on thermal and dynamic stratification in the atmosphere and frequently occurs during pronounced vertical wind and temperature gradients. Two turbulent layers are frequently observed: one above the jet stream and one below it. Turbulence is minimal on the jet stream level. It was also observed that over Moscow and Sukhumi the turbulent layer seldom exceeds 200—400 m and only over Tashkent at 5—7 km is it ever more than 1000 m thick. The experimental work was carried out by the Central Aerological Observatory, Moscow. Also

Card 2/3

ACCESSION NR: AT4038390

cited are turbulence data for the United States and data collected by E. A. Hyde (1954) for air routes from London to the Far East and back, and London to North Africa. Orig. art. has: 12 tables, 20 figures, and 36 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 11Jun64 ENCL: 00

SUB CODE: ES NO REF SOV: 019 OTHER: 006

Card 3/3

L 63791-65 EWT(1)/FCC GW
ACCESSION NR: AP5019430 UR/0020/65/163/003/0631/0633

AUTHOR: Lominadze, V. P.; Khrgian, A. Kh. 55

TITLE: Effect of mountain elevations on atmospheric humidity

SOURCE: AN SSSR. Doklady, v. 163, no. 3, 1965, 631-633

TOPIC TAGS: atmospheric humidity, relative humidity, absolute humidity 12,55

ABSTRACT: Mountain elevations and mountainous regions have a considerable effect on the structure and properties of the atmosphere above them. In particular, the relative and absolute humidity increase: in the atmosphere over mountains, the humidity is higher than in the atmosphere over neighboring flatlands situated at the same altitude. Data on the vapor pressure over Mineral'nyye Vody and Tbilisi, located in the Central Caucasus at a distance of 200 km from each other, were compared for the summer months, when the vapor pressure is highest and its variations are appreciable. The data indicate that the higher vapor pressure above mountainous regions is due to greater evaporation from the forests, meadows, snow, and ice of these regions. A consequence of the rise in humidity is a lowering of the condensation level and increase in the amount of precipitation of all types. In addition, an increased humidity causes a greater absorption of long-wave

Card 1/2

L 63791-65
ACCESSION NR: AP5019430

2

radiation from the sun and earth, and explains the higher air temperature above mountains. Orig. art. has: 2 tables.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)
55

SUBMITTED: 01Dec64 ENCL: 00 SUB CODE: ES

NO REF SOV: 003 OTHER: 001

Card 2/2

[redacted], V. [redacted]

[redacted] word. Trudy [redacted] no. [redacted] '63. (MIRA 12:2)

1. [redacted] nauchno-issledovatel'skiy gidrometeorologicheskiy institut [redacted] Vsesoyuznaya [redacted] komissii.

L 1807-66 EWT(1)/FCC GW
ACCESSION NR: AT5022886

UR/2789/65/000/063/0109/0113
551.551.5

AUTHOR: Belyayev, V. P.; Beltadze, T. G.; Gadakchan, V. O.; Lominadze, V. P.

TITLE: Some results of comparing radiosonde and aircraft measurements of turbulence in the free atmosphere

SOURCE: Tsentral'naya aerologicheskaya observatoriya. Trudy, no. 63, 1965. Voprosy dinamiki atmosfery (Problems of atmospheric dynamics), 109-113

TOPIC TAGS: atmospheric turbulence, free atmosphere, aircraft bump, aircraft measurement, radiosonde measurement

ABSTRACT: Measurements made from aircraft of atmospheric turbulence are compared with radiosonde measurements (with an overload attachment) to determine the value of radiosonde data for predicting turbulent zones over air routes. To test the method it was necessary to make experimental plane flights to measure bumpiness intensity over the same area with the radiosonde measurements. Analyses showed that there were zones in which there was good agreement between data from the two sources, including agreement concerning the thickness of the disturbing zone. However, in other cases it was found that although radiosonde and airplane data simultaneously detected dis-

Card 1/2

L 1807-66
ACCESSION NR: AT5022886

turbed zones, the two methods yielded different values for the thickness of the zone (either method could yield the higher value). Good agreement was obtained in about 74% of the comparisons. Data from three series of tests in the Tbilisi region indicate that there is a 75--85% probability that turbulence will occur or not occur over a period of 1 1/2 hr. Orig. art. has: 1 figure and 1 table. [ER]

ASSOCIATION: Tsentral'naya aerologicheskaya observatoriya (Central Aerological Observatory)

SUBMITTED: 00 ENCL: 00 SUB CODE: ES

NO REF SOV: 002 OTHER: 000 ATD PRESS: 4111

Card 2/2

L 26966-65 EWT(l)/EPA(sp)-2/T/EEC(t)/EPA(w)-2/EWA(m)-2 Pz-6/Po-4/Pab-10/Pi-4
IJP(c) AT
ACCESSION NR: AP5003252 S/0057/65/035/001/0154/0156

AUTHOR: Demidenko,I.I./ Lomino,N.S./ Padalka,V.G./ Safronov,B.G./Sinel'nikov,K.D.

TITLE: On possible development of instabilities in a plasma captured by a transverse magnetic field 21 42 41 B

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.1, 1965, 154-156

TOPIC TAGS: plasma, plasma instability, transverse magnetic field, longitudinal magnetic field

ABSTRACT: The development of instabilities in plasma bursts trapped by a transverse magnetic field and traveling parallel to it were investigated. The apparatus and the peculiarities of the capture and propagation of the plasma bursts have been previously described by four of the present authors (ZhTF 34,1183,1964). In the present experiments the plasma bursts passed through a 1.5 cm diameter circular aperture in a screen located 30 cm from the point of capture and were observed at various distances from the screen with a "plasmascope". When the screen was of dielectric material, or when it was of metal but floating, a tongue emerged from the more dense side of the plasma, grew, and reached the wall of the chamber after the plas-

Card 1/2

L 26966-65
ACCESSION NR: AP5003252

ma burst had traveled some 60 cm from the screen. This instability is assumed to be of the Rayleigh-Taylor type and due to the rotation of the plasma, its inhomogeneity, and the presence within it of a net negative charge. When the screen was of metal and grounded, the development of this instability was almost entirely suppressed. Experiments were also performed with a screen containing a 4 mm wide slot instead of a circular aperture. In this case the instability did not develop. The failure of flute instability to develop in the plasma sheets that passed through the slot is discussed briefly. Orig.art.has: 4 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR,Khar'kov (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 14 Aug64 ENCL: 00 SUB CODE: ME,EM

NR REF SOV: 004 OTHER: 005

Card 2/2

L 52020-65 EPF(n)-2/EPA(w)-2/EWT(1)/EWG(m) Pi-4/Po-4/Pz-6/Pab-10 IJP(c) AT

ACCESSION NR: AP5012046 UR/0057/65/035/005/0823/0826

AUTHOR: Demidenko,I.I.; Lomino,N.S.; Padalka,V.G.; Safronov,B.G.; Sinel'nikov,K.D.

TITLE: Investigation of some properties of a plasma captured by a transverse magnetic field

SOURCE: Zhurnal tekhnicheskoy fiz.ki, v. 35, no. 5, 1965, 823-826

TOPIC TAGS: plasma trapping, plasma magnetic field, plasma polarization, plasma injection

ABSTRACT: The authors have previously found (ZhTF, 34, 43, 1964; DAN SSR, 157, 1335, 1964) that a portion of the plasma injected into a transverse magnetic field is captured by the field and moves parallel to it. They have continued their investigation of this phenomenon (which is not understood) with an apparatus similar to that previously employed, but larger. In the present apparatus the longitudinal magnetic field is maintained in a 12 cm diameter, 300 cm long drift tube; with the plasma transversely injected at the center of the drift tube, the motion of the captured plasma could be followed for 120 cm. The polarization of the captured plasma was observed with probes. After a decrease of 20 to 50% in

Card 1/2

L 52020-65

ACCESSION NR: AP5012046

the first 30 or 40 cm, the polarization decreased only very slowly with distance from the injection point. The expected drift of the captured plasma in the crossed fields (the electric field due to polarization and the applied magnetic field) was observed with the aid of a slotted plastic diaphragm and a "plasmascope" (L.I.Yelizarov and A.V.Zharinov, Nucl. Fus., Suppl., 2, 699, 1962). The effect of shorting out the plasma polarization with a copper disk was investigated; this was found, in accord with the findings of D.A.Baker and J.F.Hammel (Phys. Rev. Letters, 8, 157, 1962), to inhibit the transverse motion of the captured plasma. Orig. art. has: 2 formulas and 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR, Khar'kov (Physico-technical Institute, AN SSSR)

SUBMITTED: 1 May64 ENCL: 00 SUB CODE: ME

NR REF SOV: 004 OTHER: 002

Card 2/2 fmb

L 43922-66 EWT(1) IJP(c) (D/AT
ACC NR: AT6020398 (N) SOURCE CODE: UR/0000/65/000/000/0021/0026

AUTHOR: Demidenko, I. I.; Lomino, N. S.; Padalka, V. G.; Safronov, B. G.; Sinel'nikov, K. D.

ORG: none

TITLE: Possible occurrence of instabilities in a plasma captured by a transverse magnetic field

SOURCE: AN UkrSSR. Issledovaniye plazmennykh sgustkov (Study of plasma clusters). Kiev, Naukova dumka, 1965, 21-26

TOPIC TAGS: plasma containment, plasma instability, plasmoid, plasma injection

ABSTRACT: This is a continuation of earlier investigations of plasma captured by a transverse magnetic field (ZhTF, 1964, v. 34, 1183 and elsewhere). Although the conditions in the earlier investigations were such that no instabilities could develop in the plasma, the authors show that such instabilities can develop after the plasmoid passes through a diaphragm which is installed at a sufficiently large distance from the point of injection of the plasma in the magnetic field. At the large distance from the injection point, the plasmoid has a sufficiently large ratio of longitudinal energy to transverse energy, and an appreciable density gradient. The instability begins to develop in the region of maximum plasma density, and the inhomogeneity of the density over the cross section of the plasmoid stimulates the development of the instability. Arguments are presented in favor of classifying this as a

Card 1/2

ACC NR: AT6020398

Rayleigh-Taylor type of instability which develops in the homogeneous magnetic field as a result of plasma rotation. A similar instability was observed when the dielectric diaphragm was replaced by a metallic but ungrounded diaphragm. When the metallic diaphragm was grounded, practically no instability developed. Certain qualitative explanations of the phenomena are presented. Orig. art. has: 4 figures.

SUB CODE: 20/ SUBM DATE: 11Nov65/ ORIG REF: 005/ OTH REF: 005

Card 2/2

ACC NR: AP6033412 SOURCE CODE: UR/0057/66/036/010/1779/1786

AUTHOR: Domidonko, I.I.; Lomino, N.S.; Padalka,V.G.

ORG: none

TITLE: Characteristics of the interaction of a fast plasma with a transverse magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 10, 1966, 1779-1786

TOPIC TAGS: plasma gun, plasma injection, plasma magnetic field, transverse magnetic field, magnetic trap

ABSTRACT: The authors investigated the entrapment of hydrogen plasma bursts from a 17.5 cm long 7.2 cm diameter coaxial plasma gun powered by the 15 kV discharge of a 15 microfarad capacitor by a transverse magnetic field of strength up to 0.2 tesla. The plasmas travelled from the gun to the transverse magnetic field through an 80 cm long tube of glass or metal. The behavior of the plasmas was observed with both electric and magnetic probes and with 4 mm microwaves, and the composition of the plasma that traversed the magnetic field was recorded with a parabola type (Thompson) mass spectrometer. The plasmas from the coaxial gun had two components: a fast component with a velocity of 7×10^5 m/sec and a relatively low density, and a slow component with a velocity of 1.5×10^5 m/sec and a density exceeding 7×10^{13} cm^{-3}. The fast component was entrapped by very weak fields (0.01-0.02 tesla), and it is

Card 1/2 UDC: 533.9

ACC NR: AP6033412

concluded that it would be very difficult to inject these fast plasmas transversely into a magnetic trap because they would become entrapped in the fringe field. When the drift tube was of glass the slow plasmas were also rather rapidly entrapped and did not reach the region of strong magnetic field. When the drift tube was of metal, however, the slow plasma component tended to penetrate the transverse magnetic field and could be entrapped in a region of high field strength. The difference between the behaviors of the plasmas in the glass and metal drift tubes is ascribed to short circuiting of the plasma polarization by the walls of the metal drift tube and consequent deceleration of the plasma. It is concluded that for transverse injection of plasma into a magnetic trap one should select an injector that produces slow dense plasmas. The authors thank K.D.Sinel'nikov and B.G.Safronov for valuable discussions. Orig.art. has: 9 figures.

SUB CODE: 20 SUBM DATE: 05Jul65 ORIG.REF: 009 OTH REF: 002

Card 2/2

ACC NR: AP6033417 SOURCE CODE: UR/0057/66/036/010/1819/1825

AUTHOR: Demidenko,I.I.; Lomino,N.S.; Padalka,V.G.; Rutkevich,B.N.; Sinel'nikov,K.D.

ORG: none

TITLE: Investigation of the motion of a plasma burst in a nonuniform transverse magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 10, 1966, 1819-1825

TOPIC TAGS: hydrogen plasma, plasma magnetic field, transverse magnetic field, nonhomogeneous magnetic field, plasma injection

ABSTRACT: This paper begins with a brief theoretical discussion in the drift approximation of the adiabatic motion of a plasma in a nonuniform transverse magnetic field. It is shown that the plasma is decelerated on entering a region of high transverse magnetic field strength and accelerated on leaving such a region, owing to the transformation of kinetic energy of forward motion into kinetic energy of rotation and vice versa. If the magnetic field becomes strong enough the plasma can be reflected. The authors tested their theoretical conclusions by firing plasmas from a conical plasma gun through an 80 cm long 7 cm diameter drift tube across a transverse magnetic field of up to 0.2T produced by a solenoid in a 12 cm diameter transverse tube. The magnetic field gradient was adjusted with the aid of soft iron shields within the plasma drift tube; these shields were covered with glass tubes to prevent the plasma from coming

UDC: 533.9

Card 1/2

ACC NR: AP6033417

in contact with them. The plasma gun was powered by the 15 kV discharge of a 15 microfarad capacitor and produced plasmas containing 70% hydrogen ions with densities of about 10^{14} cm^{-3} and velocities of about 2.5×10^4 m/sec. The theoretical linear relation between the square of the plasma velocity and the strength of the transverse magnetic field was confirmed by the experiments. Plasmas with densities as low as 10^{12} cm^{-3} were obtained with the aid of an iris mounted in the drift tube. These plasmas did not conform to the adiabatic theory, but were to a considerable extent entrapped in the transverse magnetic field, particularly when the field gradient was high. It is concluded that low density hydrogen plasmas can be entrapped by a transverse magnetic field of considerable strength. The authors thank B.G.Safronov and N.A.Khizhnyak for valuable discussions. Orig. art. has: 10 formulas and 6 figures.

SUB CODE: 20 SUBM DATE: 11Oct65 ORIG.REF: 006 OTH REF: 004

Card 2/2

LOMINSKIY, S.V. [Laminski, S.V.]

Some features of the effect of the mechanical properties of sulfur-containing steel castings on the cutting speed. Vestsi AN BSSR. Ser. fiz.-tekh. nav. no.3:120-124 '61. (MIRA 14:10)

(Steel castings)
(Metal cutting)

L2049

17 8200

S/250/62/006/006/005/006
I003/I203

AUTHOR: Lominskiy, S.V.

TITLE: A new method of enhancing the machinability of steel castings

PERIODICAL: Akademiya nauk Belorusskoy SSR. Doklady, v.6, no.6, 1962, 366-369

TEXT: The possibility was investigated of enhancing the machinability of steel castings by addition of Na_2SO_3, $Na_2S_2O_5$, and their mixtures to the molten steel before pouring it into molds. In order to clarify the influence of the sulfur introduced in other forms and to check the assumption that sodium alone might exert any beneficial influence, stick sulfur, FeS, and Na_2CO_3 were added to molten steel. The addition of $Na_2S_2O_3$ to the molten steel resulted in improved machinability, while that of stick sulfur and FeS exerted such influence to a considerably lesser extent, and the addition of Na_2CO_3 showed no significant effects. The mechanism by which these

Card 1/2

S/250/62/006/006/005/006
I003/I203

A new method of enhancing...

additions influence the machinability is described. There are 2 figures.

ASSOCIATION: Institut mashinovedeniya i automatizatsii AN BSSR (Institute of Machine Control and Automation, AS BSSR)

SUBMITTED: October 17, 1961

Card 2/2

LOMINSKIY, S.V.

Chemical admixtures improve the machinability of metals. (MIRA 18:3)
Mashinostroitel' no.2:32-33 F '65.

LOMIYA, N. Ya.

Pollination selectivity in lemon. Agrobiologia 5:789-791 S-O '61.
(MIRA 17:11)

1. Sukhumskaya opytnaya stantsiya subtropicheskikh kul'tur Vsesoyuznogo nauchno-issledovatel'skogo instituta rasteniyevodstva, Leningrad.

LOMIYA, N.Ya.

Seed progeny of lemon developed by remote hybridization.
Agrobiologiia no.6:844-848 N-D '63. (MIRA 17:2)

1. Sukhumskaya opytnaya stantsiya subtropicheskikh kul'tur,
g. Gul'ripshi.

LOMIYA, N.Ya.

Pollination selectivity of lemon. Agrobiologiia no.4: 624-625 Jl-Ag '61. (MIRA 14:7)

1. Sukhumskaya optnaya stantsiya Vsesoyuznogo instituta rasteniyevodstva.
(Lemon) (Fertilization of plants)

LOMIYA, N.Ya.

Effect of the pollen parent on the sexual and nucellar progeny of the lemon. Agrobiologiia no.6:912-914 N-D '61. (MIRA 15:2)

1. Sukhumskaya opytnaya stantsiya subtropicheskikh kul'tur.
(Lemon breeding)

Co[illegible] of dimethylvinylcarbinol with phenol in the presence of phosphoric acid and ascanite. A. I. Kikh[illegible]niashvili, T. Lomsa, and L. Murachya (State Univ., Tiflis). *Zhur. Obshchei Khim.* 25, 117-20; *J. Gen. Chem.* (U.S.S.R.) 25, 101-3(1955)(Engl. translation); cf. C.A. 47, 6370c.—To 10 g. PhOH and 8 ml. H_3PO_4 (d. 1.701) was added dropwise 11 g. $Me_2C(OH)CH:CH_2$, the final temp. reaching 45°; after 1 hr. stirring the mixt. was dild. with Et_2O, washed and distd. yielding after extn. with aq. NaOH, 6 g. *p*-$HOC_6H_4CH_2CH:CMe_2$ (I), b_4 127-8°, n_D^{20} 1.5345, d_{20} 0.9966; hydrogenation over Pd gave the *p*-$HOC_6H_4CH_2CH_2CHMe_2$, b_7 128-30°, n_D^{20} 1.5105, d_{20} 0.9665. Methylation of I with Me_2SO_4 in 10% NaOH gave the *methoxy analog* (II), b_4 113-15°, n_D^{20} 1.5238, d_{20} 0.9793. Heating I with $ClCH_2CO_2H$ in 10% NaOH gave $Me_2C:CHCH_2C_6H_4OCH_2CO_2H$-*p*, m. 76-7°. Oxidation of II with $KMnO_4$ gave *p*-$MeOC_6H_4CO_2H$ and Me_2CO. I was formed in 3.6 g. yield when the reactants were stirred 5 hrs. at room temp. and 10 hrs. at 40-5° in the presence of ascanite (sulfuric acid treated clay). Condensation of *p*-$HOC_6H_4CH_2CH_2CHMe_2$ with $ClCH_2CO_2H$, as above, gave *p*-iso-$PrCH_2CH_2C_6H_4OCH_2CO_2H$, m. 103-4° (from dil. EtOH). G. M. K.

(2)

LOMIYA, Ya.; POGORELOV, N.; MILOVIDOVA, N.D., redaktor; TISHKEVSKIY, I.I., tekhnicheskiy redaktor

[Good yields of tea leaves] Vysokie urozhai chainogo lista. [Moskva, Izd-vo Ministerstva sel'skogo khoziaistva SSSR, 1955] folder (4 p.)
(Tea)
(MLRA 10:1)

KHIDASHELI, A.N.; NADARAYA, G.B.; LOMIYA, Ya.N.

Experimental heating of lemon trees with briquets burning without flame and smoke under gauze coverings. Biul.VNIICHiSK no.2:94-106 '57. (MIRA 15:5)

(Georgia--Lemon) (Frost protection)