Electrical properties of...

2807
S/181/61/003/009/006/039
B102/B104

(C. S. Hung. Phys. Rev. 79, 727, 1950). An accurate analysis of data obtained allows the following conclusions to be reached: (1) A narrow acceptor band, lying 0.005 - 0.008 ev above the fundamental band, is formed in CdSe single crystals with a defect concentration of 3.10^{15} cm^{-3}. (2) The hole mobility in the fundamental band is about 3000 times as high as in the impurity band. (3) The hole mobility in the fundamental band increases as temperature drops to 20°K approximately as $T^{-3/2}$. This indicates that the holes are scattered by thermal (acoustic) lattice vibrations. (4) At 4.2°K, the Hall constant and $\Delta\rho/\rho$ H^2 drop with a rise of H. Professor D. N. Nasledov is thanked for help and interest displayed. There are 6 figures and 5 references: 4 Soviet and 1 non-Soviet.

ASSOCIATION: Kishinevskiy gosudarstvennyy universitet (Kishinev State University)

SUBMITTED: February 15, 1961

Card 3/3

L 10073-63 EWT(l)/EWT(m)/EWP(q)/BDS/EEC(b)-2--AFFTC/ASD/ESD-3--
IJP(C)/JD/JG
ACCESSION NR: AR3000373 S/0058/63/000/004/E064/E064

SOURCE: RZh. Fizika, Abs. 4E433

64

AUTHOR: Andronik, I. K.; Kot, M. V.; Shcherban, D. A.

TITLE: Electric properties of single crystals of cadmium antimonate doped with impurities

CITED SOURCE: Tr. po fiz. poluprovodnikov. Kishinevsk. un-t, vyp. 1, 1962, 37-46

TOPIC TAGS: semiconductors, doped cadmium antimonate, single crystals, electric properties

TRANSLATION: CdSb crystals doped with impurities of groups Three, Four, and Six (In, Pb, and Te) were investigated. The temperature dependences of the specific conductivity, the differential thermal emf and of the Hall effect were measured in different crystallographic directions. Assuming that at temperatures above 20° K the mechanism of scattering by phonons is effective, the formula ln Sigma = f (1/P) was used to calculate the value of the forbidden band, 0.57 ev.

Card 1/2

L 10073-62
ACCESSION NR: AR3000373

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The values of the effective masses of the electrons and holes, determined from the data on the Hall effect and the thermal emf using the Pisarenko formula are respectively m* sub n = 0.6-- 0.7 m sub 0, m* sub p = 0.4 -- 0.5 m sub 0. From measurements made at helium temperatures it is concluded that the impurities Pb, In, and Te bind the acceptors chemically. This leads to the occurrence of uncompensated acceptor levels in place of the impurity band, owing to the reduction in the acceptor concentration. On the basis of the experimental data (decrease in mobility in doped crystals; double reversal of the sign of the components of the Hall and thermal emf tensors in the crystallographic directions of a and b, and single inversion in the direction c) it is shown that the energy structure of the bands in CdSb should be complex. It is suggested that the valence band consists of two bands. V. Gurevich

DATE ACQ: 14May63 ENCL: 00 SUB CODE: PH

lm/ja
Card 2/2

Temperature dependence of the mobility of current carriers in crystals of cadmium antimonide. I. K. Andronik, M. V. Kot.

Temperature dependence of the mobility of current carriers in crystals of zinc antimonide. M. V. Kot, I. V. Kretzu.

Electrical properties of crystals of antimony sesquiselenide. M. V. Kot, S. D. Shutovo. (Presented by M. V. Kot--20 minutes).

Report presented at the 3rd National Conference on Semiconductor Compounds, Kishinev, 16-21 Sept 1963

ANDRONIK, I.K.; KOT, M.V.; SHCHERBAN, D.A.

Electric properties of single-crystal cadmium antimonide with various admixtures. Trudy po fiz. poluprov. no.1:37-46 '62. (MIRA 16:11)

ACCESSION NR: AP4041370 S/0048/64/028/006/1028/1032

AUTHOR: Andronik, I.K.; Kot, M.V.

TITLE: Temperature dependence of current carrier mobility in cadmium antimonide crystals /Report, Third Conference on Semiconductor Compounds held in Kishinev 16 to 21 Sep 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.6, 1964, 1028-1032

TOPIC TAGS: semiconductor property, electric conductivity, carrier mobility, Hall effect, thermal effect, Nernst-Ettinghausen effect, cadmium inorganic compound

ABSTRACT: The three independent components of the conductivity tensor, the Hall tensor, the thermal emf, and the tensor describing the transverse Nernst-Ettinghausen effect were measured at a number of temperatures for both p- and n-type CdSb single crystals. The measurements were undertaken partly because of the discordant data in the literature concerning the temperature dependence of the electron and hole mobilities. The n-type CdSb crystals were obtained by doping with Te. The conductivity and the Hall effect were found to be markedly anisotropic in both the impurity and the intrinsic conduction regions, but the thermal emf was anisotropic

Card 1/3

ACCESSION NR: AP4041370

ASSOCIATION: Kishinevskiy gosudarstvenny*y universitet (Kishinev State University)

SUBMITTED: 00 ENCL: 00

SUB CODE: SS, IC NR REF SOV: 010 OTHER: 006

Card 3/3

ANDRONIK,M., inz.; BERNARD, I., inz.

Classification of parts, a way of improving the automobile spare part production. Automobil Cz 8 no.8:20 Ag'64

VASIL'YEVA, N.G., dotsent; ANDRONIK, N.D., ispolnyayushchiy obyazannosti assistenta; KALINIK, A.A., ordinator

Osteosynthesis in fractures of the mandible using periosteal plexigals plates. Trudy Nauch.-issl.inst.stom. no.10:63-71 '62. (MIRA 15:10)

(JAWS—FRACTURE) (PLASTICS IN MEDICINE)

ANDRONIKASHVILI, B.G.

Studying the nature of the growth of early and late forms of the oak Quercus longipes Stev. and also chemical, physical and mechanical characteristics of its wood. Vest.Bot.sada AN Gruz.SSR. no.67:35-54 '61. (MIRA 15:7)
(Gardabani District--Oak)

L 12774-66 EWT(l)/EWT(m)/EPF(n)-2/T/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/JG/GG

ACC NR: AT6003160 SOURCE CODE: UR/3182/64/001/000/0013/0030

AUTHOR: Andronikashvili, E. L.; Politov, N. G.; Vorozheykina, L. F.; Abramishvili, M. G.

ORG: none

TITLE: Influence of defects of the structure on the mechanical properties of crystals

SOURCE: AN GruzSSR. Institut fiziki. Elektronnyye i ionnyye protcessy v tverdykh telakh, v. 1, 1964, 13-30

TOPIC TAGS: crystal defect, ionic crystal, x ray irradiation, gamma irradiation, neutron irradiation

ABSTRACT: An investigation was made of the effect of x- and gamma-ray irradiation and neutron flux irradiation in a reactor on the hardness of potassium chloride and lithium fluoride crystals at room and liquid nitrogen temperatures. Microhardness H_m, hardness to scratching H_s, and hardness according to the attenuation of pendulum oscillations H_p were established by measurements on the surfaces of specimens cut from a single crystal ingot. The optical absorption spectra were also measured. The formation of point defects such as electron F-centers due to x-ray irradiation reduced the H_m, H_s, and H_p of KCl crystals. Prolonged irradiation may result in increased H_p. Discoloration of crystals restored H_p. In LiF crystals irradiated with x- and gamma-rays H_p and H_s increased, despite the formation of F-centers, while H_m changed only

Card 1/2

Card 2/2

L 12980-66 EWT(1)/T IJP(c) GG

ACC NR: AT6003161 SOURCE CODE: UR/3182/64/001/000/0031/0041

AUTHOR: Andronikashvili, E. L.; Politov, N. G.; Getiya, M. Sh.

ORG: none

TITLE: Radiative changes of dislocation densities in ionic crystals

SOURCE: AN GruzSSR. Institut fiziki. Elektronnyye i ionnyye protsessy v tverdykh telakh, v. 1, 1964, 31-41

TOPIC TAGS: irradiation, neutron irradiation, irradiation effect, crystal [illegible] atio dislocation

ABSTRACT: An investigation was made of the influence of neutron irradiation in a reactor on the density of the dislocations in potassium-chloride and lithium-fluoride crystals. The dislocations were developed by chemical etching. Two halves of the same crystal, one-half irradiated and the other half kept as a control, were investigated. Both halves were etched simultaneously and both surfaces were compared. At small irradiation doses, no changes in microstructure were found. At doses above 3×10^{15} nvt, the microphotos of both the irradiated and nonirradiated halves began to differ appreciably. On the surface of the irradiated crystal a radiative strengthening took place. The etched figures on the irradiated surface were considerably smaller than those on the nonirradiated surface. By increasing the etching time of an irradiated crystal it was possible to bring the dimensions of the etched figures up to the "normal" size, i.e., up to

Card 1/2

ANDRONIKASHVILI, E. L.

Def. at
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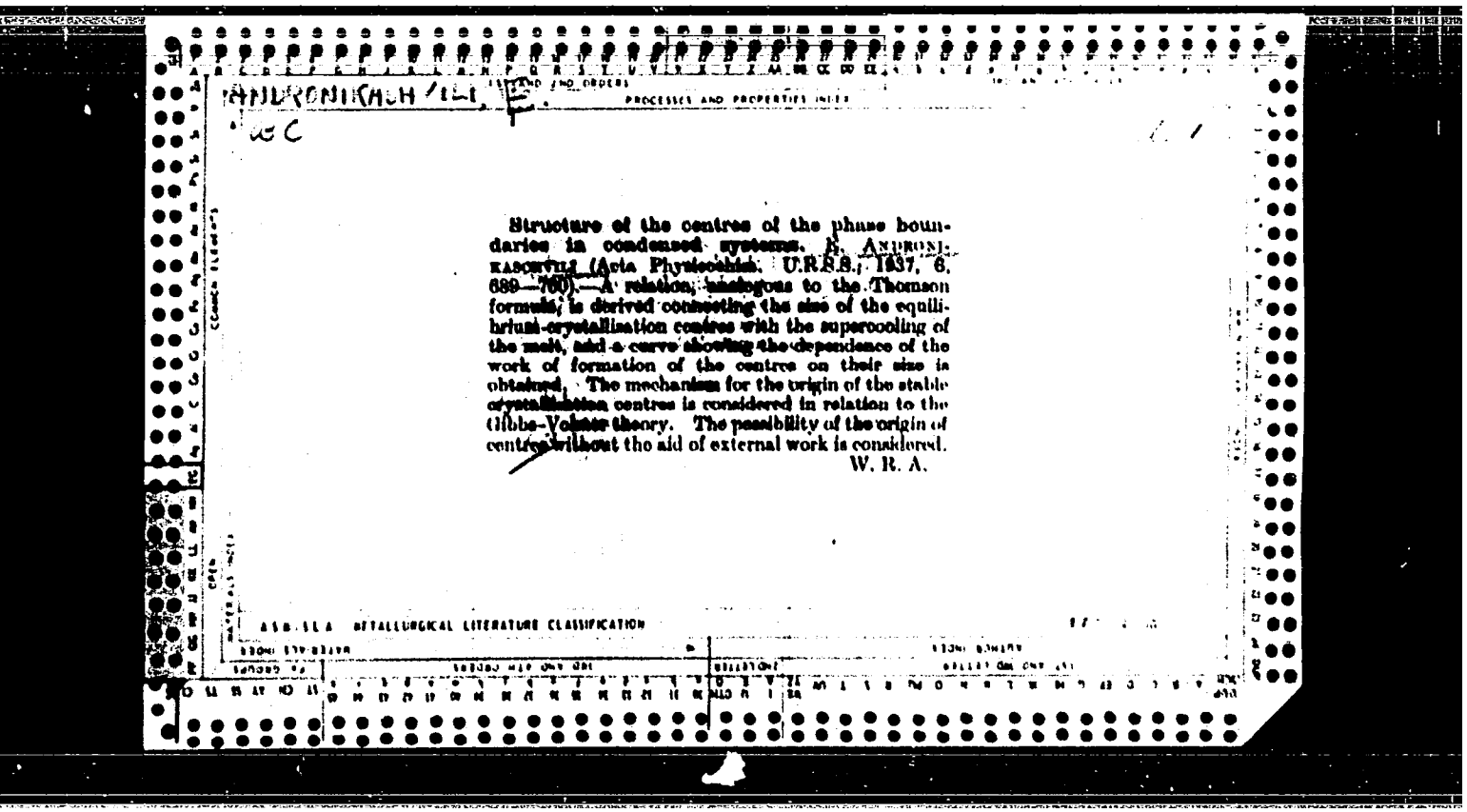


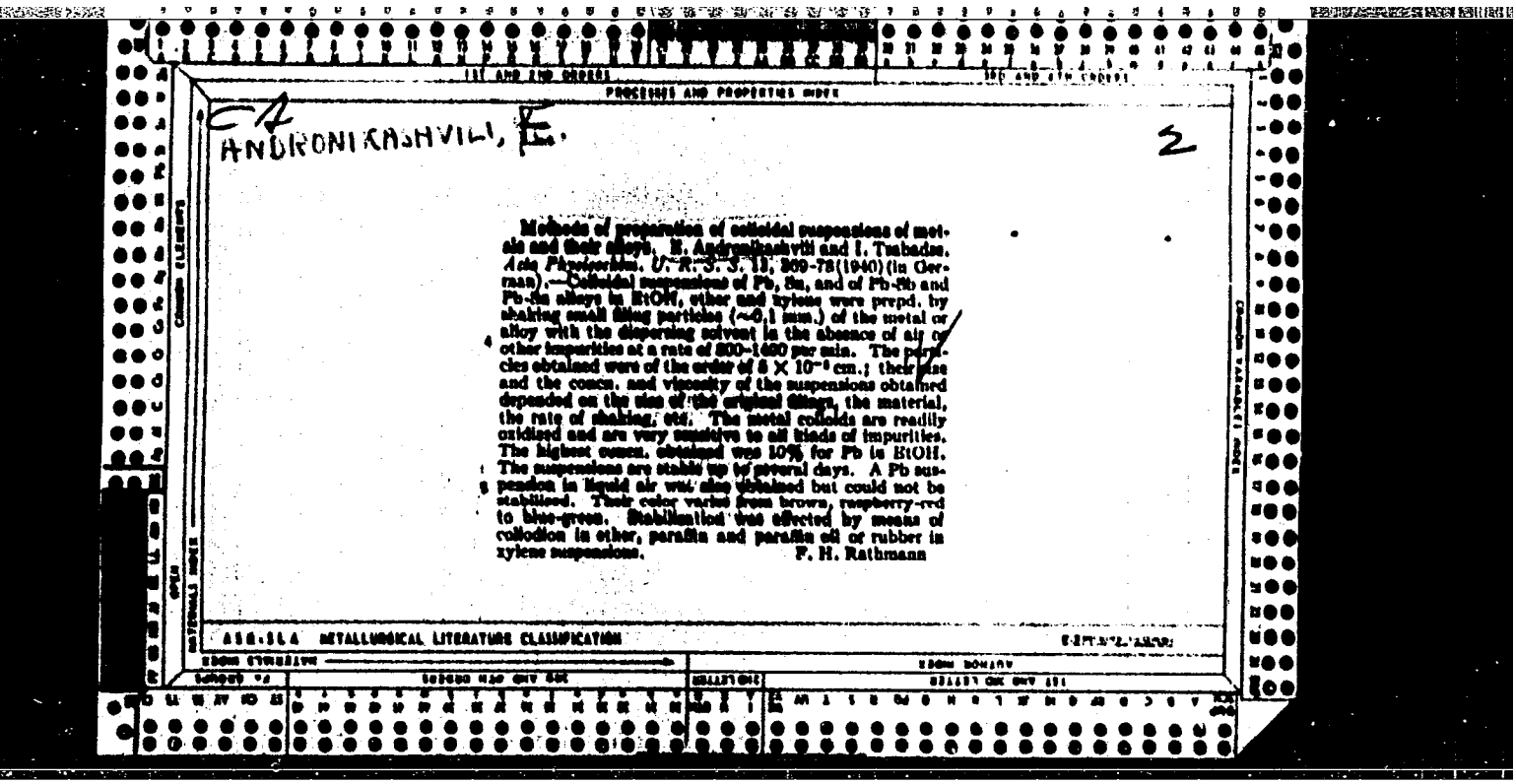
ANDRONIKASHVILI

PROCESSES AND PROPERTIES INDEX

Structure of the centres of the phase boundaries in condensed systems. E. ANDRONIKASHVILI (Acta Physicochim. U.R.S.S., 1937, 6, 689—700).—A relation, analogous to the Thomson formula, is derived connecting the size of the equilibrium-crystallisation centres with the supercooling of the melt, and a curve showing the dependence of the work of formation of the centres on their size is obtained. The mechanism for the origin of the stable crystallisation centres is considered in relation to the Gibbs–Volmer theory. The possibility of the origin of centres without the aid of external work is considered.

W. R. A.

A.S.M. METALLURGICAL LITERATURE CLASSIFICATION



CA

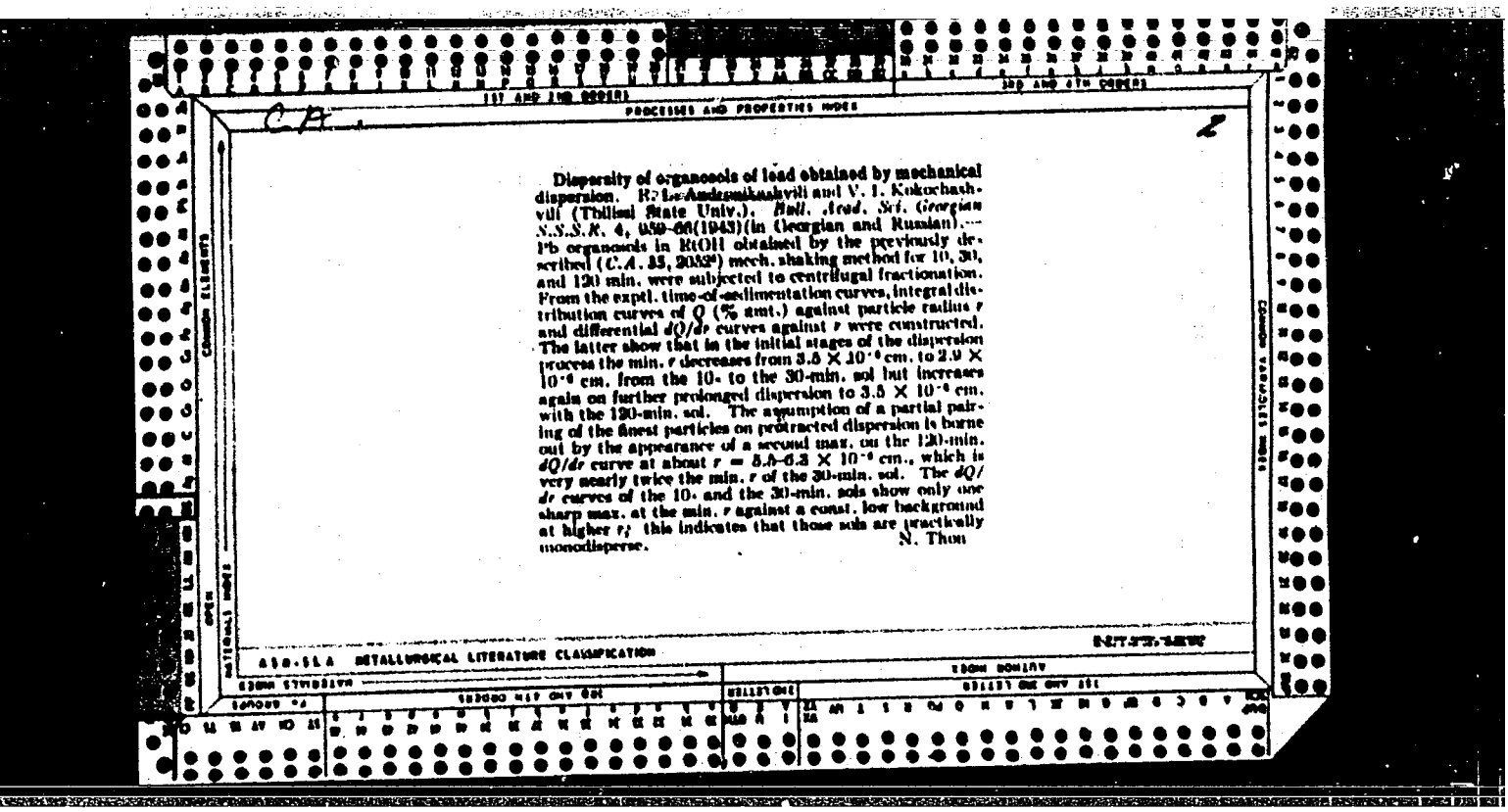
ANDRONIKASHVILI, E.

2

Methods of preparation of colloidal suspensions of metals and their alloys. E. Andronikashvili and I. Tsabadze. *Acta Physicochim. U. R. S. S.* 13, 369-78(1940)(in German).—Colloidal suspensions of Pb, Sn, and of Pb-Sb and Pb-Sn alloys in EtOH, ether and xylene were prepd. by shaking small filing particles (~0.1 mm.) of the metal or alloy with the dispersing solvent in the absence of air or other impurities at a rate of 800–1460 per min. The particles obtained were of the order of 5×10^{-6} cm.; their size and the concn. and viscosity of the suspensions obtained depended on the size of the original filings, the material, the rate of shaking, etc. The metal colloids are readily oxidized and are very sensitive to all kinds of impurities. The highest concn. obtained was 10% for Pb in EtOH. The suspensions are stable up to several days. A Pb suspension in liquid air was also obtained but could not be stabilized. Their color varies from brown, raspberry-red to blue-green. Stabilization was effected by means of collodion in ether, paraffin and paraffin oil or rubber in xylene suspensions. F. H. Rathmann

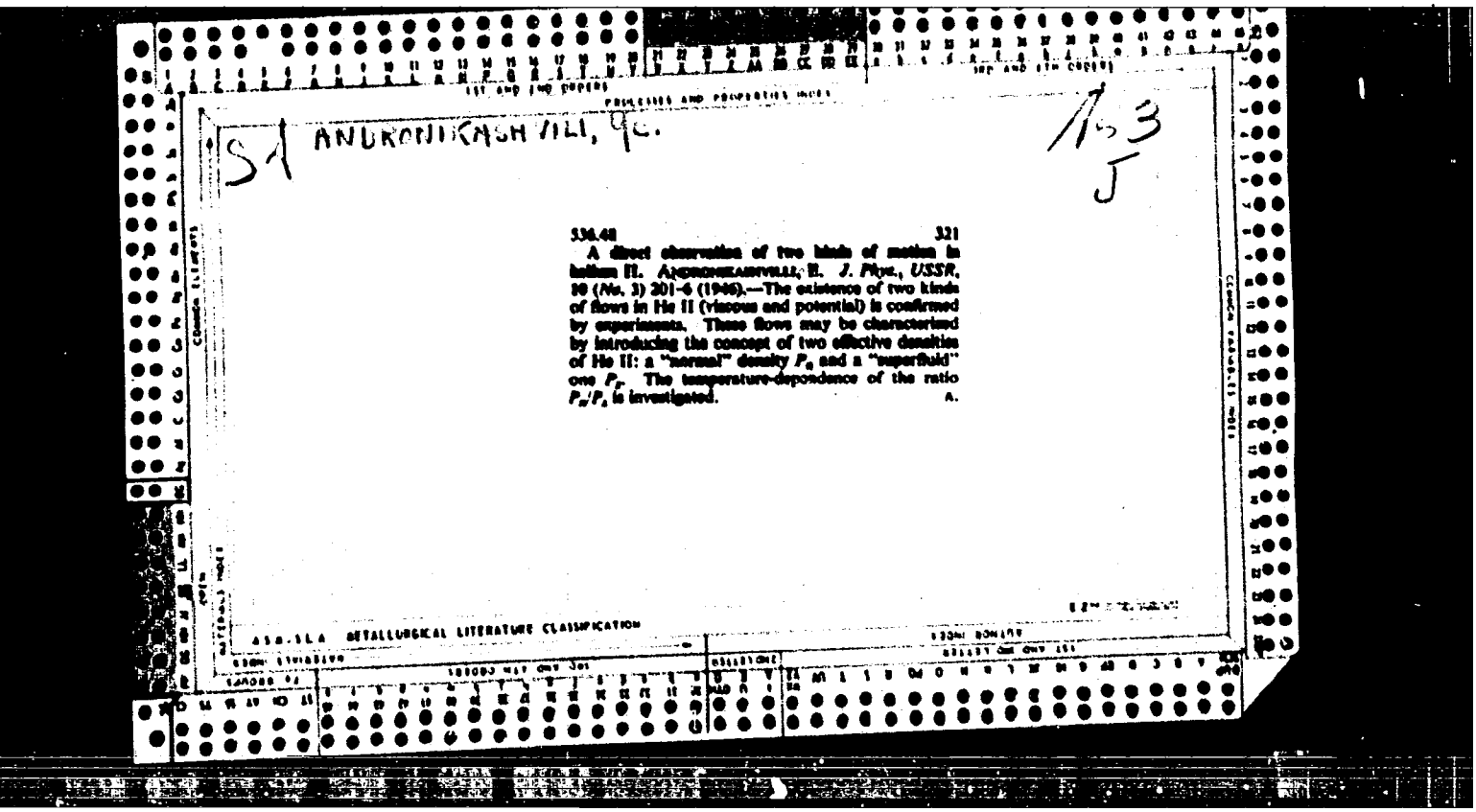
ANDRONIKASHVILI, E. L.

Superconductivity of tin–zinc eutectics. E. L. Andronikaschvili (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 841—842).—Molten Sn-Zn alloys were solidified at liquid air temp. and were then annealed at a temp. near the eutectic. Up to 1·6° K., the magnetic moment of the alloy is practically independent of [Sn], and is equal to the magnetic moment of Sn of equal vol. The threshold temp. at which superconductivity sets in is the crit. temp. of Sn (3·69° K.). Curves of magnetic moment against magnetic field show the "tails" characteristic of the disperse state. When the superconductivity of the alloys is destroyed, there is an appreciable time lag, in contrast with the effect in pure Sn. The results may be explained by supposing that the Sn screens the Zn grains. This effect may possibly be eliminated by suitable heat-treatment. A. J. M.



Dispersity of organosols of lead obtained by mechanical dispersion. R. I. Andronikashvili and V. I. Kokochashvili (Tbilisi State Univ.). *Bull. Acad. Sci. Georgian S.S.S.R.* 4, 659–66(1943)(in Georgian and Russian).—Pb organosols in BtOH obtained by the previously described (*C.A.* 35, 2032⁹) mech. shaking method for 10, 30, and 120 min. were subjected to centrifugal fractionation. From the exptl. time-of-sedimentation curves, integral distribution curves of Q (% amt.) against particle radius r and differential dQ/dr curves against r were constructed. The latter show that in the initial stages of the dispersion process the min. r decreases from 3.5×10^{-6} cm. to 2.9×10^{-6} cm. from the 10- to the 30-min. sol but increases again on further prolonged dispersion to 3.5×10^{-6} cm. with the 120-min. sol. The assumption of a partial pairing of the finest particles on protracted dispersion is borne out by the appearance of a second max. on the 120-min. dQ/dr curve at about $r = 5.5$–6.3×10^{-6} cm., which is very nearly twice the min. r of the 30-min. sol. The dQ/dr curves of the 10- and the 30-min. sols show only one sharp max. at the min. r against a const. low background at higher r; this indicates that those sols are practically monodisperse.

N. Thon



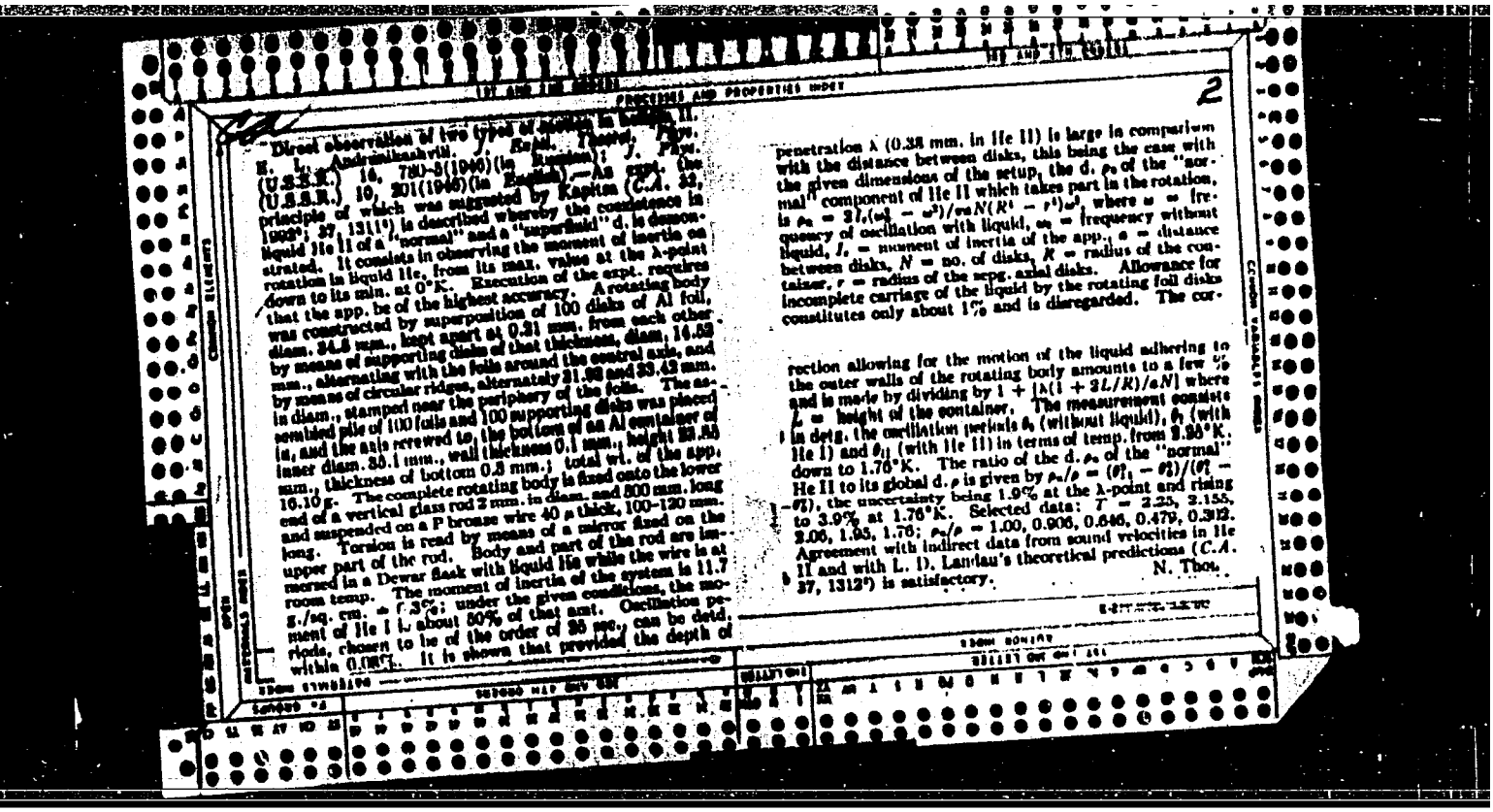
S1 ANDRONIKASHVILI, E.

1/53
J

536.48 321

A direct observation of two kinds of motion in helium II. Andronikashvili, E. *J. Phys., USSR*, 10 (No. 3) 201-6 (1946).—The existence of two kinds of flows in He II (viscous and potential) is confirmed by experiments. These flows may be characterized by introducing the concept of two effective densities of He II: a "normal" density P_n and a "superfluid" one P_s. The temperature-dependence of the ratio P_n/P_s is investigated. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PHYSICS AND PROPERTIES INDEX

2

"Direct observation of two types of motion in liquid II. ... Andronikashvili. ... Exptl. Theoret. Phys. (U.S.S.R.) 16, 780-5(1946)(in Russian); ... Phys. (U.S.S.R.) 10, 201(1946)(in English).—An expt. the principle of which was suggested by Kapitza (C.A. 35, 1992°; 37, 1311°) is described whereby the coexistence in liquid He II of a "normal" and a "superfluid" d. is demonstrated. It consists in observing the moment of inertia on rotation in liquid He, from its max. value at the λ-point down to its min. at 0°K. Execution of the expt. requires that the app. be of the highest accuracy. A rotating body was constructed by superposition of 100 disks of Al foil, diam. 34.8 mm., kept apart at 0.31 mm. from each other by means of supporting disks of that thickness, diam. 14.52 mm., alternating with the foils around the central axis, and in diam., stamped near the periphery of the foils. The assembled pile of 100 foils and 100 supporting disks was placed in, and the axis screwed to, the bottom of an Al container of inner diam. 35.1 mm., wall thickness 0.1 mm., height 33.35 mm., thickness of bottom 0.3 mm.; total wt. of the app. 16.10 g. The complete rotating body is fixed onto the lower end of a vertical glass rod 2 mm. in diam. and 800 mm. long and suspended on a P bronze wire 40 μ thick, 100–120 mm. long. Torsion is read by means of a mirror fixed on the upper part of the rod. Body and part of the rod are immersed in a Dewar flask with liquid He while the wire is at room temp. The moment of inertia of the system is 11.7 g./sq. cm. ± 1.3%; under the given conditions, the movement of He I is about 50% of that amt. Oscillation periods, chosen to be of the order of 30 sec., can be determined within 0.01%. It is shown that provided the depth of penetration λ (0.28 mm. in He II) is large in comparison with the distance between disks, this being the case with the given dimensions of the setup, the d. ρ_n of the "normal" component of He II which takes part in the rotation, is $\rho_n = 2I_z(\omega_0^2 - \omega^2)/\pi a N(R^4 - r^4)\omega^2$, where ω = frequency of oscillation with liquid, ω_0 = frequency without liquid, I_z = moment of inertia of the app., a = distance between disks, N = no. of disks, R = radius of the container, r = radius of the segm. axial disks. Allowance for incomplete carriage of the liquid by the rotating foil disks constitutes only about 1% and is disregarded. The correction allowing for the motion of the liquid adhering to the outer walls of the rotating body amounts to a few % and is made by dividing by $1 + [\lambda(1 + 2L/R)/aN]$ where L = height of the container. The measurement consists in detg. the oscillation periods θ_0 (without liquid), θ_I (with He I) and θ_{II} (with He II) in terms of temp. from 2.25°K. down to 1.76°K. The ratio of the d. ρ_n of the "normal" He II to its global d. ρ is given by $\rho_n/\rho = (\theta_I^2 - \theta_0^2)/(\theta_{II}^2 - \theta_0^2)$, the uncertainty being 1.9% at the λ-point and rising to 3.9% at 1.76°K. Selected data: T = 2.25, 2.155, 2.06, 1.95, 1.76; ρ_n/ρ = 1.00, 0.906, 0.646, 0.479, 0.312. Agreement with indirect data from sound velocities in He II and with L. D. Landau's theoretical predictions (C.A. 37, 1312°) is satisfactory. N. Thon.

FA 53T97

USSR/Physics Dec 1947
Superconductivity
Viscosity

"The Development of the Sciences of Ultraviscosity and Superconductance in the Soviet Union," E. L. Andronikashvili, K. A. Tumanov, 63 pp

"Uspekh Fiz Nauk" Vol XXXIII, No 4

Andronikashvili discusses ultraviscosity in first part, describing properties of Helium-II, discovery of ultraviscosity, reversibility of some thermohydrodynamic processes of He-II and quantum theory of ultraviscosity. Tumanov describes condition known as superconductance, including superconductance of thin

53T97

USSR/Physics (Contd) Dec 1947

films and penetration depth of material being conducted, and changes of limits of superconductivity due to compression or stretching.

53T97

ANDRONIKASHVILI, E. L.

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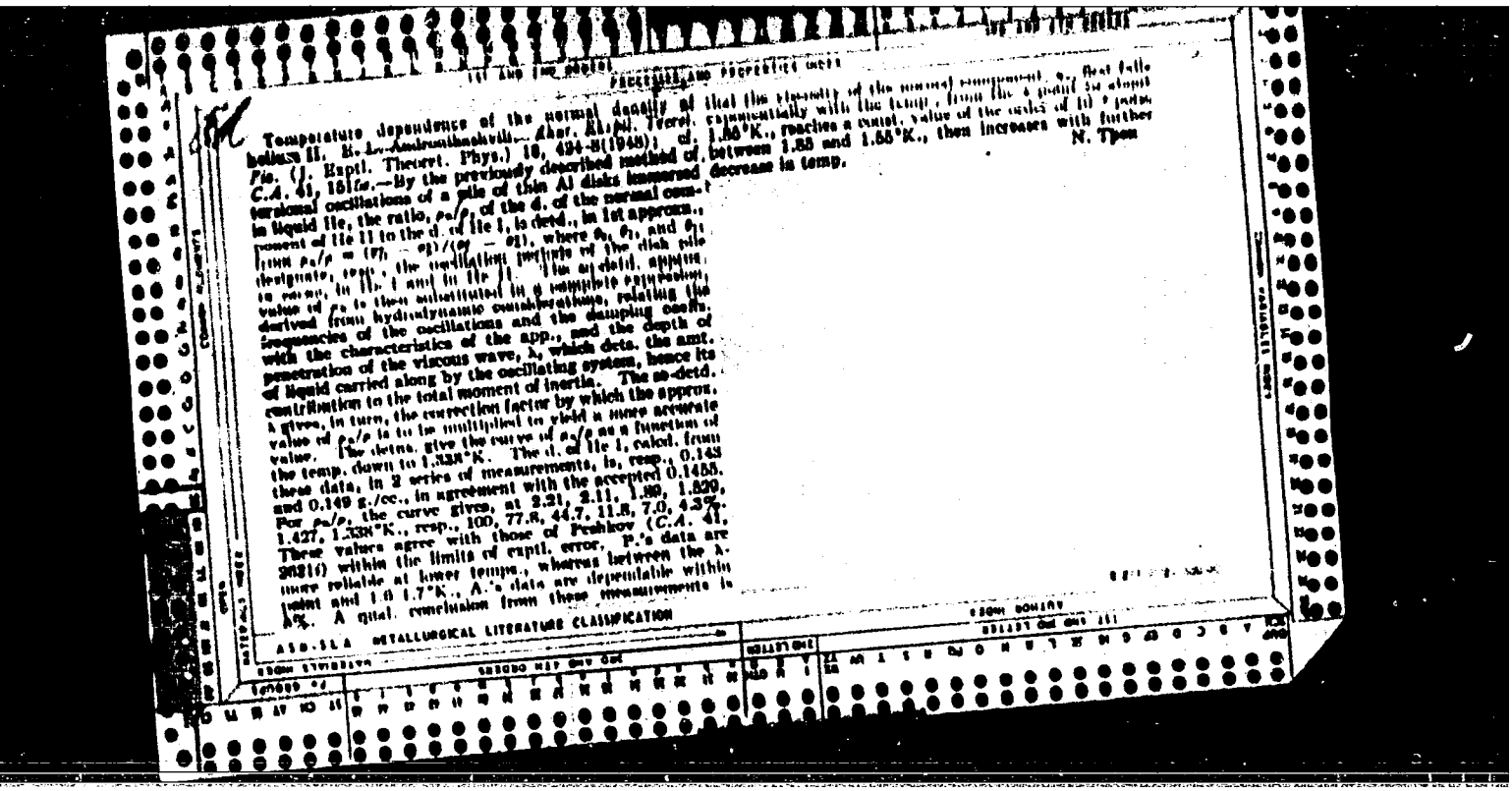
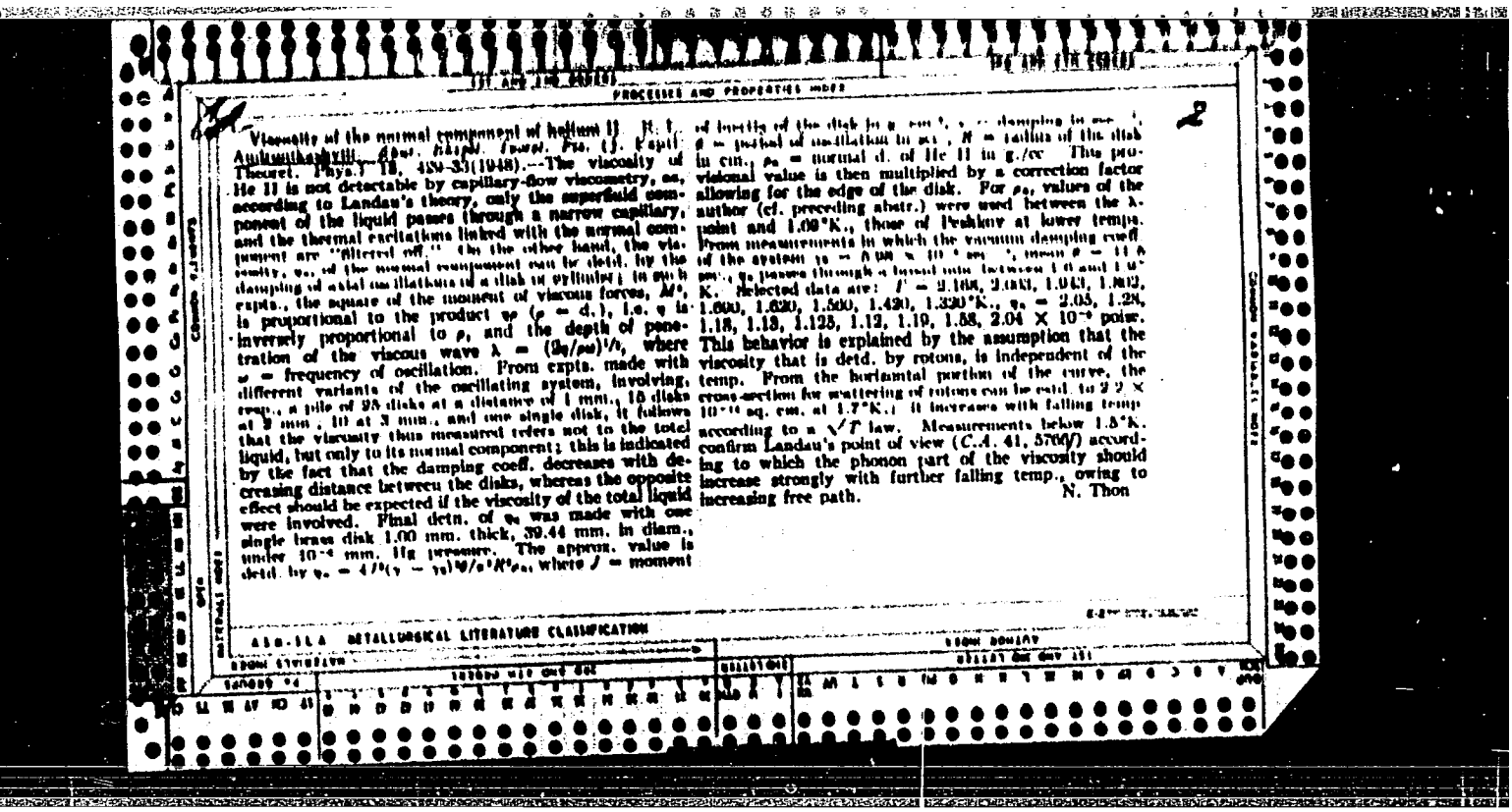


Temperature dependence of the normal quality of thal the viscosity of the normal component, η_n, first falls
helium II. K. L. Andronikashvili. Zhur. Eksptl. Teoret. commercially with the temp., from the λ point to about
Fiz. (J. Exptl. Theoret. Phys.) 18, 424-32(1948); cf. 1.80°K., reaches a const. value of the order of 10 $\times$ previous
C.A. 41, 181*a*.—By the previously described method of between 1.85 and 1.55°K., then increases with further
torsional oscillations of a pile of thin Al disks immersed decrease in temp.
in liquid He, the ratio, ρ_n/ρ, of the d. of the normal com-
ponent of He II to the d. of He I, is detd., in 1st approxn.,
from $\rho_n/\rho = (\theta_1 - \theta_2)/(\theta_2 - \theta_3)$, where θ_1, θ_2, and θ_3
designate, resp., the oscillation periods of the disk pile
in vacuo, in He I, and in He II. The original approxn.
value of ρ_n is then substituted in a successive approxn.,
derived from hydrodynamic considerations, relating the
frequencies of the oscillations and the damping coeffs.
with the characteristics of the app., and the depth of
penetration of the viscous wave, λ, which dets. the amt.
of liquid carried along by the oscillating system, hence its
contribution to the total moment of inertia. The so-detd.
λ gives, in turn, the correction factor by which the approx.
value of ρ_n/ρ is to be multiplied to yield a more accurate
value. The dets. give the curve of ρ_n/ρ as a function of
the temp. down to 1.338°K. The d. of He I, calcd. from
these data, in 2 series of measurements, is, resp., 0.145
and 0.149 g./cc., in agreement with the accepted 0.1455.
For ρ_n/ρ, the curve gives, at 2.21, 2.11, 1.89, 1.839,
1.427, 1.338°K., resp., 100, 77.8, 44.7, 11.8, 7.0, 4.3%.
These values agree with those of Peshkov (*C.A.* 41,
3021*i*) within the limits of exptl. error, P.'s data are
more reliable at lower temps., whereas between the λ-
point and 1.8 1.7°K., A.'s data are dependable within
4%. A qual. conclusion from these measurements is

ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

Viscosity of the normal component of helium II. K. R. Atkins and I. Rudnick. Phys. Rev. 77, 197-204 (1950).—The viscosity of He II is not detectable by capillary-flow viscometry, as, according to Landau's theory, only the superfluid component of the liquid passes through a narrow capillary, and the thermal excitations linked with the normal component are "filtered off." On the other hand, the viscosity, η_n, of the normal component can be detd. by the damping of axial oscillations of a disk in rotation; in such expts., the square of the moment of viscous forces, M', is proportional to the product $\eta\rho$ (ρ = d.), i.e. η is inversely proportional to ρ, and the depth of penetration of the viscous wave $\lambda = (2\eta/\rho\omega)^{1/2}$, where ω = frequency of oscillation. From expts. made with different variants of the oscillating system, involving, resp., a pile of 98 disks at a distance of 1 mm., 10 disks at 2 mm., 10 at 3 mm., and one single disk, it follows that the viscosity thus measured refers not to the total liquid, but only to its normal component; this is indicated by the fact that the damping coeff. decreases with decreasing distance between the disks, whereas the opposite effect should be expected if the viscosity of the total liquid were involved. Final detn. of η_n was made with one single brass disk 1.00 mm. thick, 39.44 mm. in diam., under 10^{-4} mm. Hg pressure. The approx. value is detd. by $\eta_n = 4I^2(\gamma - \gamma_0)\theta/\sigma^2 M^2 \rho_n$, where I = moment of inertia of the disk in g. cm.^{2}, γ = damping in sec.$^{-1}$, θ = period of oscillation in sec., M = radius of the disk in cm., ρ_n = normal d. of He II in g./cc. This provisional value is then multiplied by a correction factor allowing for the edge of the disk. For ρ_n, values of the author (cf. preceding abstr.) were used between the λ-point and 1.60°K., those of Peshkov at lower temps. From measurements in which the vacuum damping coeff. of the system is $\gamma_0 = 0.00 \times 10^{-4}$ sec.$^{-1}$, mean $\theta = 11.6$ sec., η_n passes through a broad min. between 1.6 and 1.8° K. Selected data are: T = 2.168, 2.083, 1.943, 1.802, 1.690, 1.620, 1.500, 1.420, 1.320°K., η_n = 2.05, 1.28, 1.18, 1.13, 1.125, 1.12, 1.19, 1.58, 2.04 × 10^{-3} poise. This behavior is explained by the assumption that the viscosity that is detd. by rotons, is independent of the temp. From the horizontal portion of the curve, the cross-section for scattering of rotons can be estd. to 2.2 × 10^{-16} sq. cm. at 1.7°K.; it increases with falling temp. according to a $\sqrt{T}$ law. Measurements below 1.5°K. confirm Landau's point of view (*C.A.* 41, 5760*f*) according to which the phonon part of the viscosity should increase strongly with further falling temp., owing to increasing free path.

N. Thon

ASM-ILA METALLURGICAL LITERATURE CLASSIFICATION

ANDRONIKASHVILI, E. L. PA 170T104

USSR/Physics - Helium II Jun 49

"Problem of Heat Transmission in He II," E. L. Andronikashvili, Inst of Phys Problems, Acad Sci USSR

"Zhur Eksper i Teoret Fiz" Vol XIX, No 6, pp 535-42

Analyzes results of measurements of subject transmission of heat in He II. Defines limits of applicability of Landau's theory to this phenomenon and to that of the motion of the normal component. Submitted 26 Feb 49.

170T104

L 32612-66 EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6014023 SOURCE CODE: UR/0056/66/050/004/0856/0860

50
49
B

AUTHOR: Andronikashvili, E. L.; Gamtsemlidze, G. A.; Dzhaparidze, Sh. A.

ORG: Tbilisi State University (Tbilisskiy gosudarstvennyy universitet)

TITLE: Study of the character of oscillations of helium II near the surface of an oscillating disc by the resonance method

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 4, 1966, 856-860

TOPIC TAGS: liquid helium, quantum liquid, vortex, superfluidity, WAVE PROPAGATION

ABSTRACT: The purpose of the investigation was to determine the depth of penetration of the supercritical (vortical) oscillations produced in He II in which a disc oscillates with amplitude above a critical value, and caused by formation of quantum vortex filaments. To determine the penetration and to study the character of the propagation of the waves generated by the disc in this region, the authors used a special setup permitting measurement of the oscillations by reflecting a beam of light from a suspended mirror. The tests show that at amplitudes below critical, the depth of penetration agrees with the value obtained for a viscous wave, but at supercritical amplitudes the depth of penetration decreases with increasing amplitude. In the subcritical mode, the depth was 0.48 ± 0.02 mm, and in the supercritical mode the values obtained were 0.33 ± 0.01, 0.36 ± 0.01, and 0.40 ± 0.01 mm at amplitudes of 0.73, 0.61, and 0.44 radians, respectively. The temperature dependence of the depths of

Card 1/2

Card 2/2 dd

1. ANDRONIKASHVILI, Ye. L.
2. USSR (600)
4. Quantum Theory
7. Experimental basis of quantum hydrodynamics, Soob. AN Gruz. SSR 12, No. 9, 1951.

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

Effect of the compactness of dislocation on the process of creep. Soob. AN Gruz.SSR 13 no.8:457-462 '52. (MLRA 6:5)

1. Tbilisskiy Gosudarstvennyy Universitet imeni Stalina (for Mgebryan).
2. Akademiya Nauk Gruzinskoy SSR (for Andronikashvili).

(Creep of metals)

ANDRONIKOSHVILI, E. L.

USSR/Physics - Helium II Jan 52

"Certain Problems of the Hydrodynamics of Helium II," E. L. Andronikoshvili, Inst of Phys Problems, Acad Sci USSR; Inst of Phys, Acad Sci Georgian SSR

"Zhur Eksper i Teoret Fiz" Vol XXII, No 1, pp 62-65

Clarifies the problem concerning the possibility of the existence of nondamping circular currents in helium II. Shows that under the conditions of the present expts such currents of superfluid liquids do not occur. Submitted 3 Apr 51.

204T103

ANDRONIKASHVILI, E.L.; BILILASHVILI, M.F.; SAKVARELIDZE, I.I.; KHUTSISHVILI, G.R.

Underground investigation of cosmic rays. Izv. AN SSSR.Ser.fiz.19 no.6: 681-686 N-D '55. (MLRA 9:4)

1. Institut fiziki Akademii nauk Gruz.SSR.
(Cosmic rays) (Nuclear physics)

ANDRONIKASHVILI, E. L.

USSR/Physics - Low temperature study FD-1901

Card 1/1 Pub. 146-21/21

Author : Andronikashvili, E. L., and Kaverkin, I. P.

Title : Rotation of helium II at great speeds

Periodical : Zhur. eksp. i teor. fiz. 28, 126-127, January 1955

Abstract : The attempts to verify experimentally the theoretical depth of the parabolic meniscus formed by rotating helium II. He presents the dependence of the magnitude of thermomechanical effect upon the speed of rotation at various temperatures. He concludes that in the transition through the critical speed the phenomenon of superfluidity not only does not disappear, but the quantitative characteristics (e.g. thermomechanical effect and the associated quantity of density ratio) remain unchanged and independent of the speed of rotation. Three references: e.g. E. L. Andronikashvili, Dissertation, Institute of Physical Problems, Academy of Sciences USSR, Moscow, 1948 (in which the experimental apparatus is described).

Institution: Institute of Physical Problems, Academy of Sciences USSR
Institute of Physics, Academy of Sciences, Georgian SSR

Submitted : June 24, 1954

ANDRONIKASHVILI, Ye. L.

USSR/Physics - Helium II FD-2912

Card 1/1 Pub. 146 - 12/19

Author : Andronikashvili, E. L.; Mirskaya, G. G.

Title : Behavior of helium II close to heat dispersing surfaces

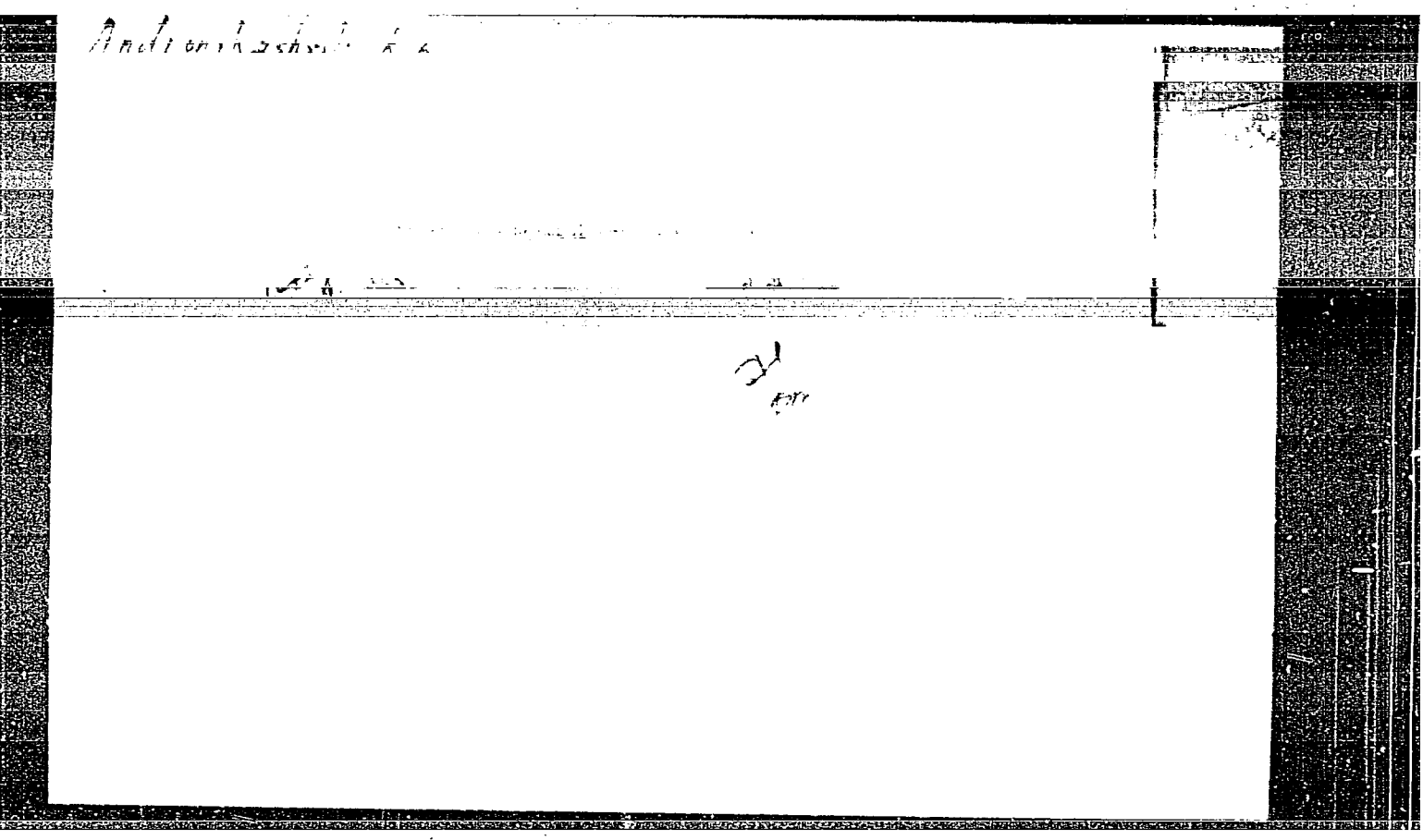
Periodical : Zhur. eksp. i teor. fiz., 29, October 1955, 490-494

Abstract : The authors investigate the magnitudes of the temperature discontinuities that occur in the surface layer of helium II bounded by a solid wall to which heat is being conducted. They show that under these conditions a remarkable heat resistance occurs in the thin layer of helium II. They find the dependence of temperature drop upon load, which turns out to be linear only for small loads, and that the thermal resistance close to the heat radiating surface decreases noticeably with increase in pressures. They establish that close to the heat radiating surface in helium II the existence of superheatings which reach 1^{o} is possible. Six references: e.g. I. M. Khalatnikov, ibid., 22, 687, 1952; E. L. Andronikashvili, ibid., 19, 535, 1949.

Institution : Institute of Physics, Academy of Sciences of Georgian SSR
Institute of Physical Problems, Academy of Sciences of USSR

Submitted : June 5, 1954

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000101420018-4"



SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1297
AUTHOR ŠACHULOV,O.A., KEBULADZE,N.A., ANDRONIKAŠVILI,E.L.,ABAŠIDZE, K.A.
TITLE A New Type of Decay of a Heavy Meson ?
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.1, 167-168 (1956)
Publ. 7 / 1956 reviewed 9 / 1956

In the summer of 1955 I.I. GUREVIČ and his collaborators exposed an emulsion chamber with 45 layers of a photoemulsion of 400 μ thickness of the type P in a height of from 25 to 27 km. The emulsion chamber remained in this altitude for 2 hours. Hereafter the emulsion chamber was placed at the disposal of the authors who found the following three cases after a microscopic examination: 1.) A charged particle of unknown mass has a range of 2000 μ in the emulsion; it then comes to a standstill and decays into a positive pion with a trace of 365 μ length. The positive pion in turn decays into a positive myon with a trace length of 630 μ, and the latter decays into a positron. The entire sequence of decays takes place in the plane of a photo emulsion. 2.) A charged particle of unknown mass is ejected from a star with 4 black and 3 relativistic traces; after 5600 μ it comes to a standstill and decays into a negative pion which then forms a σ-star. The decay sequence is in the plane of a photo emulsion. 3.) A charged particle of unknown mass comes to a standstill after 6500 μ and decays into a positive pion. This act of decay and the following ones ($\pi^+ \rightarrow \mu^- \rightarrow$positron) are in the plane of a photo layer. All three cases have the existence of a pion trace with 357 μ $\pm$ 2% in common. As all these pions are monochromatic, the $\pm$ particle of unk wn mass most probably decays according to

ANDRONIKASHVILI, E.L.

JANOSSY, L.
21(1)

PHASE I BOOK EXPLOITATION SOV/1911

International Conference on Cosmic Radiation. Budapest, 1956.

International Conference on Cosmic Radiation Organized by the Hungarian Academy of Sciences. Budapest, 1957. 187 p. 800 copies printed.

Sponsoring Agency: Magyar Tudomanyos Akademia

Eds.: L. Janossy, and A. Szeogyi

PURPOSE: This report is intended for geophysicists concerned with cosmic radiation.

COVERAGE: This report contains the slit plenary sessions of the conference. Some of the problems dealt with include nuclear emulsions, extensive air showers and the program of cosmic ray measurements planned for the International Geophysical Year. Most of the reports are followed by references. Soviet scientists in the field of cosmic radiation who attended the conference are: E.L. Andronikashvili, E.A. Dobrotin, I.I. Gurevich, S.I. Nikolskiy and S.N. Vernov. The articles are written in English, German and Russian without parallel translations.

Card 1/6

International Conference (Cont.) SOV/1911

3. Nikol'skiy, S.I. The Study of Nuclear Active Components of Extensive Atmospheric Showers of Cosmic Rays 50
4. Vernov, S.N., and Zatsepin, G.T. Height Dependence and the Problem of the Core of Extensive Atmospheric Showers (not incl.)
5. Chudakov, A.Ye., Cherenkov Radiation of Extensive Atmospheric Showers of Cosmic Rays 57
6. Andronikashvili, E.L., and K.P. Mikiashvili. The Study of the Spatial Dispersion of Penetrating Particles of Extensive Atmospheric Showers 63

THIRD SESSION

EXTENSIVE AIR SHOWERS

1. Babecki, J.L., Jurkiewicz, and J.M. Masalski. The Transition Curve of the Electron-Photon Component of Extensive Air Showers in Lead Absorbers of Thicknesses Between 0 and 25 cm. 73
2. Janossy, L., T. Sandor, and A. Szeogri. Investigation of Extensive Air Showers 230 m. Above Sea Level 96

Card 3/6

AUTHOR ANDRONIKASHVILI, E.L., BIBILASHVILI, M.F., PA - 2712

TITLE The Spatial Distribution of the Hard Components of the Broad Atmospheric Showers.
(O prostranstvennom raspredelenii pronikayushchey komponenty shirokikh atmosfernykh livey, Russian)

PERIODICAL Zhurnal Eksperim.i Teoret.Fiziki,1957,Vol 32, Nr 2,pp 403-404 (U.S.S.R.)
Received 5/1957 Reviewed 6/1957

ABSTRACT The authors investigated this spatial distribution in an altitude of 400 m above sea level in a tunnel situated 26,6m below the surface of the earth (65,5 m water equivalent). The density of the hard particles was measured at distances of 0,1o, 2o, 3o, 45 and 6o m from the symmetry axis of the separating system and the showers were separated by means of a tube selector. In addition, the measuring device contained correlated hodoscopic systems for the determination of the total numbers of the particles and the location of the transition of the trunk of the broad atmospheric showeras well as a subterranean one for recording the particles of the hard components. The showers were recorded by means of a cinematographic apparatus. Showers with from $1o^5$ to $5.1o^5$ particles were recorded best. The data determined in the course of 2156 working hours of this device are shown in a table. The experimental data obtained in this way are approximated satisfactorily within the statistical limits of errors by a GAUSS' distribution of the form $\varphi(r)=o,61 \exp\left[-o,00059\ r^2\right]$ While carrying out measurements the authors did not take the angular distribution of the "trunks" of the broad atmospheric shower and the in-

Card 1/2

Andronikashvili, E.L.

AUTHORS: Kazarov, R.Ye., Andronikashvili, E.L. 56-6-42/47

TITLE: Index of an Energetic Spectrum of the Penetrating Component in Extended Atmospheric Torrential Rains With Fixed Number of Particles (O pokazatele energeticheskogo spektra pronikayushchey komponenty v shirokikh atmosfernykh livnyakh s zadannym chislom chostits)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1957, Vol. 33, Nr 6, pp. 1528-1530 (USSR)

ABSTRACT: The energy spectrum of the penetrating cosmic radiation component was measured at an altitude of 400 m above sea level and in a depth that corresponds to 61, 127, 162 m water equivalent. For measuring large-surface Geiger-Müller counting tubes in hodoscopic arrangement were used, and the following results were obtained:

Depth in water equivalent:	Density of penetrating particles in m^{-2}	Effective +) distance in m
61	0.49 ± 0.07	16
127	0.20 ± 0.02	27
162	0.15 ± 0.02	29

Card 1/2

ANDRONIKASHVILI, E. L.,

"Experiments on Superfluidity"

paper presented at the Conference on Low Temperature Physics, Kamerlingh Onnes, Conf, Leiden, 23-28 June 1958.

Dir., Physical Inst. Acad. Sci. Georgian SSR, Tibilisi

PHASE I BOOK EXPLOITATION SOV/3500

Akademiya nauk Gruzinskoy SSR. Institut fiziki

Trudy, tom 6 (Transactions of the Physics Institute of the Academy of Sciences Gruzinskaya SSR, Vol. 6) Tbilisi, 1958. 282 p.

PURPOSE: This book is intended for physicists and physical chemists, and may be used by students taking advanced courses in physics and physical chemistry.

COVERAGE: This is a collection of articles by members of the Physics Institute on such subjects as helium-II, color centers, polarized deuterons in a magnetic field, effect of gamma-rays on copper oxides, digital computer programs, extensive air showers, effect of thermal gradient on crystals, and the theory of heavy unstable particles. The last article, in Georgian, is a brief resume of the development of physics in Georgia during the past 40 years. Abstracts in English are given after each article. No personalities are mentioned. References accompany each article.

TABLE OF CONTENTS:

Andronikashvili, E. L. Oscillatory and Rotational Studies of Helium-II 3

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ANDRONIKASHVILI, E.L.

Vibration and rotation experiments with helium II. Trudy Inst. fiz.AN Gruz.SSR 6:3-32 '58. (MIRA 15:4)
(Liquid helium) (Rotating masses of fluid) (Vibration)

ANDRONIKASHVILI, E.L.

Hydrodynamics of axial-torsional vibrations in a viscous fluid.
Trudy Inst.fiz.AN Gruz.SSR 6:33-41 '58. (MIRA 15:4)
(Hydrodynamics) (Liquid helium)

TSAKADZE, D.S.; ANDRONIKASHVILI, E.L., akademik.

Formation of shift elasticity in rotating helium II. Soob. AN Gruz. SSR 20 no.6:667-672 Je '58. (MIRA 11:10)

1.Tbilisskiy goudarstvennyy universitet imeni Stalina. 2. AN Gruzinskoy SSR (for Andronikashvili).
(Helium)

S/627/60/002/000/014/027
D299/D305

3.2410

AUTHORS: Andronikashvili, E. L., and Kazarov, R. Ye.

TITLE: An energy-spectrum study of penetrating component of extensive air showers

SOURCE: International Conference on Cosmic Radiation. Moscow, 1959. Trudy. v. 2. Shirokiye atmosfernyye livni i kaskadnyye protsessy, 159-162

TEXT: The energy spectrum of the penetrating component was studied by investigating the absorption of the μ-mesons at various underground depths. The measurements were conducted in various parts of the town of Tbilisi, at an altitude of 400 m above sea level. Due to the requirement of mobility of apparatus, the experiments were not conducted under optimum conditions, yet the local possibilities were exploited to the full. The apparatus consisted of a surface part, incorporating hodoscoped counters, and an underground detector. The counters permitted measuring the soft-component density over a range of 2 to 400 particles/m^2. The detector was placed at

Card 1/3

depths of 162, 127 and 61 m; in one experimental series it was placed on the surface and shielded with lead. The shower size was determined to an accuracy of ± 50%, using the Nishimura-Kamata distribution with an age parameter s = 1.25. The showers detected were divided into 3 groups according to particle number. Only those data were processed which corresponded to showers, whose axes were contained within a circle of radius 28 m from the center of the detection system. The energy spectrum for an effective distance of 28 m from the shower axis is shown in a figure. For showers of small size, the spectrum is represented by a straight line with inclination 0.54 ± 0.07. For large showers, with number of particles 2.9. $\cdot 10^5$, the spectrum grows steeper with greater depths and the spectrum component becomes close to unity. Another figure shows the meson-component spectra. Each of these spectra can be represented by a straight line with inclination nearly unity. The inclination increases with number of particles in the shower. The maximum value of the exponent was found to be 1.25 ± 0.20, for a shower with 2.9. 10^5 particles. According to these spectra, the mean energy of the

24. (0)

AUTHORS: Andronikashvili, E. L., Tsakadze, D. S. SOV/56-37-1-60/64

TITLE: The Propagation of Oscillations Along Vortex Filaments in Rotating Helium II (Rasprostraneniye kolebaniy vdol' vikhrevykh nitey vo vrashchayushchemsya gelii II)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1, pp 322 - 323 (USSR)

ABSTRACT: The following "Letter to the Editor" is the reproduction of a lecture delivered at the 5. All-Union Conference for the Physics of Low Temperatures (Tbilisi 1958). The authors carried out experiments with rotating He II and found that the results obtained by these experiments confirm Onsager's hypothesis as well as Feynman's theory, which is based upon the former, and that they also agree with the experimental results obtained by Hall (Refs 1-3). For the purpose of interpreting these experiments the authors assumed that transversal elastic waves propagate along the vortex filaments (experiment by Hall, observation of periodic frequency variations of the oscillations of a thin disk under rotating He II). Deviating from Hall, the authors measured the magnitude of the logarithmic damping decrement δ of the oscillations of the disk. The measuring method has al-

ready been described by the authors in an earlier paper (Ref 4). Figure 1 shows the results of measurements in form of a diagram (ordinate δ, abscissa: number of periods); measuring temperature: 1.38°K, rotation frequency $\omega = 55.10^{-3}\text{sec}^{-1}$. The helium level above the surface of the disk varied rapidly as a result of the intense brightening (podsvechivaniye) (evaporation rate $3.6.10^{-2}$mm/min). Figure 2 shows the same as figure 1, but after elimination of the level variation of the liquid on the disk, which in this case developed slowly (0.5 mm/sec). The curves obtained show that with a variation of the evaporation rate of the liquid on the disk, also the character of periodic damping varies. This may be explained by the assumption that in the case of oscillations of the disk, a standing transversal wave is formed in the vortex filaments. The distance between two adjoining resonances corresponds to a lowering of the level by 0.065 cm. The authors thank Yu. G. Mamaladze for discussions, and further T. M. Shul'ts, K. B. Mesoyed and I. M. Chkheidze for

The Propagation of Oscillations Along Vortex Filaments in Rotating Helium II SOV/56-37-1-60/64

assisting in carrying out the experiments. There are 2 figures and 4 references, 3 of which are Soviet.

ASSOCIATION: Tbilisskiy gosudarstvennyy universitet (Tbilisi State University)

SUBMITTED: April 28, 1959

Card 3/3

24(8) SOV/56-37-2-40/56

AUTHOR: Andronikashvili, E. L., Tsakadze, D. S.

TITLE: An Experimental Investigation of the Harmonic Oscillations of a Disk in Rotating Helium II

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 2(8), pp 562-564 (USSR)

ABSTRACT: This paper has been submitted at the All Union Congress on Low-temperature Physics, in Tbilisi, October 1958. Earlier investigations (Refs 1,2,3,4) took no account of the changes in the damping processes in rotating helium II. An apparatus has been developed by the authors, in which a transparent cup of organic glass (diameter 44 mm, filled with liquid helium) moved with an angular velocity of $\omega = 13.10^{-3} sec^{-1}$ to $\omega = 129.10^{-3} sec^{-1}$. A disk with a diameter of 30 mm and a thickness of 1 mm was suspended within the helium bath. This disk followed two motions simultaneously: 1) the rotation with a velocity equal to that of the cup and 2) a harmonic oscillation about an axis perpendicular to the disk plane and parallel to the generatrix of the cup. The determination of the logarithmic decrement of

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SOV/56-37-2-40/56

An Experimental Investigation of the Harmonic Oscillations of a Disk in Rotating Helium II

the disk oscillations is described. In helium II δ the decrement depends markedly upon the rotational speed. The curve describing the relative increase of the damping effect due to the rotation as dependent upon the rotational frequency passes through a maximum both for a rough and for a smooth disk. The course of the slope of the curve after the maximum differs for the rough and the smooth disk, the sign of the curvature also being different. For a smooth disk the curve is parallel to the abscissae near the coordinate origin. This speaks in favor of a gliding of the vortexes relatively to the polished surface, that is the vortexes do not adhere to the surface. In a diagram the temperature course of the maximum increase of the damping (for $\omega = 55.10^{-3}$ sec^{-1}) of a rough disk is shown. The increase of the damping due to the subtraction of the superfluid component amounts in the entire temperature interval to less than 65-70% of the damping caused by the friction of the normal component. For the purpose of explaining the particularities of the curves discussed herein Yu. G. Mamaladze proposed to replace the

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An Experimental Investigation of the Harmonic Oscillations of a Disk in Rotating Helium II

linear dependence of the quantity $(\delta - \delta_H/\delta_H)$ upon ω (which applies to the first section of the curve) by a more complicated dependence, when the distance between neighboring vortexes approaches their effective diameter. The authors express their gratitude to Yu. G. Mamaladze and S. G. Matinyan for valuable suggestions and to L. A. Zamtaradze, T. G. Shul'ts, and I. M. Chkheidze for their help in performing the experiments. There are 2 figures and 5 references, 4 of which are Soviet.

ASSOCIATION: Tbilisskiy gosudarstvennyy universitet (Tbilisi State University)

SUBMITTED: April 28, 1959

S/124/62/000/007/013/027
D234/D308

AUTHORS: Andronikashvili, E. and Tsakadze, D.

TITLE: Hydrodynamics of rotating helium II

PERIODICAL: Referativnyy zhurnal, Mekhanika,no. 7, 1962, 45, abstract 7B291 (Tr. Tbilissk. un-ta, 1960, 86, 1-43)

TEXT: The authors describe experimental investigations of viscous properties of quantum and classical rotating liquids, and the results of theoretical investigations of the same problem. Using an eleastically suspended disc, the authors found that the dependence of viscous properties on the velocity of rotation in helium II differ essentially from the same dependence in classical liquids. Measurements carried out with the aid of a hollow cylinder submerged in rotating quantum liquid showed that such a liquid has space anisotropy of viscous properties. Besides, a shear modulus in helium II and the possibility of propagation of elastic waves along vortex threads formed in rotating helium II were found. All these experimental facts agree well with the Onsager-Feynman theory

Card 1/2

S/749/60/007/000/001/012

AUTHORS: Andronikashvili, E. L., Bibilashvili, M. F., Dekanosidze, Ye. N., and Kazarov, P. E.

TITLE: On the selection of extensive air showers with a [illegible] number of particles and on the determination of their electron-photon component parameters (In Georgian, with a 4-page Russian résumé).

SOURCE: Akademiya nauk Gruzinskoy SSR. Institut fiziki. Trudy, v.7, 1960, 3-18.

TEXT: This is the description of a shower-selecting array for the investigation of the penetrating component of extensive cosmic-ray air showers, and an explanation of methods for the determination of optimal parameters for such a system. In 1958 the Institute of Physics, AS GruzSSR, constructed a 150-m long tunnel with varying depth (200 mwe max.) for the investigation of the penetrating component of extensive air showers (EAS). A surface laboratory with a ramified selection array was built above the tunnel to select, detect, and determine the EAS. Optimum system parameters and optimal observational conditions were calculated on electronic computers. Since the location of the shower axis and the total number of particles can be found by measurement at 3 points of an EAS plane of observation, a standard pattern consisting of an equilateral triangle (circumradius 20 or 40 m) was used, with groups of EAS counters and hodoscopic counter groups: the triangle

Card 1/2

S/749/60/007/000/003/003

AUTHORS: Andronikashvili, E. L., Mamaladze, Yu. G., Tsakadze, D. S.

TITLE: On the measurement of the logarithmic damping decrement.

SOURCE: Akademiya nauk Gruzinskoy SSR. Institut fiziki. Trudy, v. 7, 1960, 59-66. (In Georgian, with 2-1/2 page Russian résumé.)

TEXT: A difficult problem has arisen in connection with the hydrodynamics of superfluid media, namely, the determination of the damping of torsional oscillations of a disk superimposed on its uniform rotation about its own axis. A method is proposed to tie the oscillatory amplitude to the time elapsed between the transits of a pencil of light through two fixed points; the method is equally applicable to a measurement of the damping decrement in oscillations of any other type. A mirror system is attached to the usual rotary suspension system of the experiment, and the reflected pencils of light are picked up by two photomultipliers located symmetrically with respect to the equilibrium position. The transit time elapsed between the two photomultipliers is measured electronically; the time increases as the oscillation is damped, and the logarithmic damping decrement is found from the relationship between the transit times, (τ), the number of half-periods, (n), and the oscillatory period T which, in simplified form (for a symmetrical arrangement of the photomultipliers and weak damping) reads:

Card 1/2

Andronikashvili, E.L.; Politov, N.G.; Getiya, M.Sh.; Vorozheykina, L.F.

ference on

ABSTRACT: The formation of dislocations and color centers in LiF and KCl crystals
irradiation was investigated. The specimens were irradiated in
a reactor they were subsequently etched and the
concentrations

Card 1/2

L 39764-65

ACCESSION NOR: AP5009505

each substance had two maxima at approximately the same doses, namely, 0.4 x [illegible] the first. The 10.10 mvt. In LSF the second max mum [illegible] also had two maxima, one at the dose corresponding to [illegible] respectively.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: SS

NO REF SOV: 006 OTHER: 001 ATD PRESS: 3230

Card 2/2

S/056/60/038/03/06/033
B006/B014

24.6900

AUTHORS: Andronikashvili, E. L., Kazarov, R. Ye.

TITLE: Experimental Study of the Energy Spectrum of the Penetrating Component of Extensive Air Showers/9

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 3, pp. 703-707

TEXT: In the article under review, the authors studied the energy spectrum (absorption) of the muon component of extensive air showers in the range 0.4 - 37 Bev. The investigations were made in various pits in Tbilisi, 400 m above sea-level. Fig. 1 shows a block diagram of the device. A threefold coincidence between Geiger-counter groups was used for the shower separation. The resolution of the separator was $2.5.10^{-6}$ sec, that of the subterranean, twofold coincidence was $2.5.10^{-6}$ sec, and that of the hodoscope was 4.10^{-5} sec. In the various series of subterranean measurements, the group of hodoscope counters was placed at a depth of 162, 127, and 61 m water equi-

Card 1/3

Experimental Study of the Energy Spectrum of the Penetrating Component of Extensive Air Showers

S/056/60/038/03/06/033
B006/B014

valent, in one series of measurements the detector of the penetrating particles on the surface was contained in a lead casing of 3.2 m water equivalent. The measurements were divided into three groups of showers with particle numbers of 7.10^3 - $2.8.10^4$, $2.8.10^4$ - $1.1.10^5$, and $1.1.10^5$ - $4.5.10^5$; the average particle numbers were $1.4.10^4$, 7.10^4, and $2.9.10^5$. The results obtained in the various series of measurements are compiled in a table. The mean density ρ_μ of the muon flux was calculated from the equation $\rho_\mu = \frac{1}{\sigma} \ln \frac{n}{n - n_\mu}$, where σ denotes the area of a detector series, n the number of recorded showers of one group, and n_μ the number of showers of this group with muon admixture. The distance r between detector and shower axis at a depth h is expressed by the relation $r^2 = R^2 \sin^2\varphi + (R\cos\varphi\cos\vartheta - h \sin\vartheta)^2$, where R is the distance between the trace of the shower axis on the surface and the origin of coordinates, φ and ϑ the azimuth- and zenith angles. Fig. 2 shows the energy spectrum. The muon spectrum in the logarithmic coordinate system may be well represented by a straight line with a slope of 0.54 ± 0.07.

Card 2/3

83173

S/056/60/039/002/010/044
B006/B056

24.6900

AUTHORS: Andronikashvili, E. L., Roynishvili, N. N.

TITLE: The Transverse Component of the Momentum of Strange Particles Generated in Penetrating Cosmic Ray Showers

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 2(8), pp. 267 - 270

TEXT: One of the most interesting phenomena of nuclear interaction at high and ultra-high energies is the constancy of the transverse momentum components (P_t) of the secondary cosmic-ray pions and the relatively small spread of momenta round the mean value (0.3 ÷ 0.5) Bev/c. The transverse components of the momenta of nucleons, antinucleons, and strange particles have hitherto been only little investigated. Perkins and Takibayev found the P_t-value of the three last-mentioned particles to be spread considerably and attaining values up to several Bev/c. The authors of the present paper attempted to carry out a direct measurement of P_t on Λ^0, θ^0, and $\Sigma^{\pm}$ particles recorded in the El'brus

Card 1/3

The Transverse Component of the Momentum of Strange Particles Generated in Penetrating Cosmic Ray Showers

S/056/60/039/002/010/044
B006/B056

laboratory. The particles were recorded by means of a double cloud chamber in a magnetic field. The apparatus and method are more closely described in Refs. 2-7. Measurements were carried out on 20 Λ^0, 21 θ^0, and 30 $\Sigma^{\pm}$ particles, whose other parameters were known. In order to characterize the recording probabilities of the particles, each decay event was provided with a weight W_i^{-1}, where W_i is the a priori probability of its recording. The error in the number of events recorded per P_t interval is then given by $(\Sigma W_i^{-2})^{1/2}$. The recording probability $\overline{W}$ as a function of P_t is shown in Fig. 1. Up to about 2 Bev/c, $\overline{W}$ shows no spread. Fig. 2 shows the P_t-distribution of all decay events of strange particles corrected in this way. The mean values $\overline{P}_t$ measured are given in a table. The P_t-spectrum has its most probable value in the momentum range (0.2 - 0.4) Bev/c, and attains values of up to 3 Bev/c. It is,

87542

S/053/60/072/004/002/006
B029/B056

11.3120

AUTHOR: Andronikashvili, E. L.

TITLE: Investigation of the Thermal Structure of Helium II by Scattering of Cold Neutrons

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol. 72, No. 4, pp. 697-710

TEXT: L. D. Landau (Ref. 1) postulated a certain shape of the spectrum of thermal oscillations of helium II already in 1947. According to calculations made by I. M. Khalatnikov (Ref. 2), the following numerical values hold for the parameters of the roton: $\Delta/k = 8.9^{\circ}K$; $p/\hbar = 1.99$ Å^{-1}; $\mu = 0.26\ m_{He}$. The superfluid component of helium II, unlike its normal component, contains neither phonons nor rotons, and is a medium in which quasiparticles of both types are discretely distributed. Various attempts at determining the inner structure of helium II by neutron diffraction study have failed. According to M. Cohen and R. P. Feynman (Ref. 9), the

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between the two experiments as well as between theory and experiment. Yarnell found $\Delta/k = (8.68 - 0.0084)T$ °K for the empirical temperature dependence of the gap width. The production energy of a roton decreases with an approach of temperature to the λ-point. The production probability of the roton grows not only by an increase of the temperature of the exponent, but also by a decrease of the gap width. A noticeable decrease of the gap width begins at 1.8 - 1.9°K. Within this temperature range, rotons enter into interaction with one another. L. P. Pitayevskiy (Ref. 14) investigated the manner in which the Landau dispersion curve ends within the range of high momenta. At high energies and momenta there exists a certain threshold of roton stability. The roton may either emit a phonon or decay into two excitons with the same directions of motion and the same final momenta, or into two excitons with different directions of emission. Various problems connected herewith will probably soon be solved. It is noted that Nobel Prize winner Lee, together with Mohling (Ref. 15) demonstrated a possibility of immediately determining the chirality of rotons. The angular dependence of the intensity of the scattered neutrons indicates whether rotons have an eigenangular momentum or not. Data

ANDRONIKASHVILI, E. L., BIBILASHVILI, M. F., VARDENGA, G. L., GVALADZE, T. V., JAVRISHVILI, A. K., KAZAROV, R. E., KURIDZE, R. V. and KHALDEIVA, I. I.

"Angular Distribution of the Penetrating Component of Extensive Air Showers at the Depth of 200 m.w.e."

Report presented at the International Conference on Cosmic Rays and Earth Storm, 4-15 Sep 61, Kyoto, Japan.

Physical Institute, Academyof Sciences, Georgia SSR

ANDRONIKASHVILI, Elevter Luarsabovich; GAMTSEMLIDZE, Georgiy Aristoyevich; KANCHELI, Otar Arkhipovich; MAMALADZE, Yuriy Georgiyevich; KUZNETSOVA, Ye.B., red.; KRYUCHKOVA, V.N., tekhn. red.

[Laboratory works on physics; mechanics, molecular physics, electricity, and magnetism] Laboratornye raboty po fizike; mekhanika, molekuliarnaia fizika, elektrichestvo i magnetizm. Pod red. E.L.Andronikashvili. Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1961. 182 p. (MIRA 15:3)
(Physics--Laboratory manuals)

S/053/61/073/001/001/004
B006/B056

AUTHORS: Andronikashvili, E. L., Mamaladze, Yu. G., Matinyan, S. G., Tsakadze, D. S.

TITLE: The Properties of Quantized Vortices Occurring in Rotating Helium II

PERIODICAL: Uspekhi fizicheskikh nauk, 1961, Vol. 73, No. 1, pp. 3 - 40

TEXT: A detailed review is given of experimental and, above all, theoretical investigations on the hydrodynamics of oscillations of solids suspended in rotating He II. Progress achieved recently in this field is of special importance for problems of superfluidity. The present review gives no new material but merely an explanation of the present stage of research work in this field, the authors mainly discussing their own publications and the results of their own investigation. The paper consists of four parts. The first part deals with the transcritical properties connected with the rotation of He II, the superfluid and normal components of He II, the hypothesis by Onsager-Feynman on the formation of vortex filaments and the variational problem connected herewith, the

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The Properties of Quantized Vortices Occurring in Rotating Helium II

S/053/61/073/001/001/004
B006/B056

velocity distribution in moving vortices of a superfluid liquid, and the experiments by Hall and Vinen (measurement of the circulation quantum). The second part deals with the oscillations of a solid in rotating He II; the following problems are discussed in detail: results obtained by Hall and Vinen, the energy properties of vortex systems, experimental and theoretical results obtained by Andronikashvili and Tsakadze, a disk in rotating He II, the effective density of the superfluid component as a function of the rate of rotation; comparison of the results obtained by Hall with those of scientists of the Tbilisi group (the authors); study of the damping of oscillations of a solid in rotating He II, results obtained by experimental investigations carried out at the Cryogenics Laboratory of Tbilisskiy universitet (Tbilisi University); the logarithmic damping decrement of oscillations as a function of the rotation rate under various conditions, temperature dependence of damping, dependence of the rate upon damping and oscillation frequency, resonance phenomena, investigation of the rate dependence of damping of torsional oscillations, etc. Part 3 deals with the hydrodynamics of rotating helium II; after an introduction, several results obtained by theoretical investigations by Hall;

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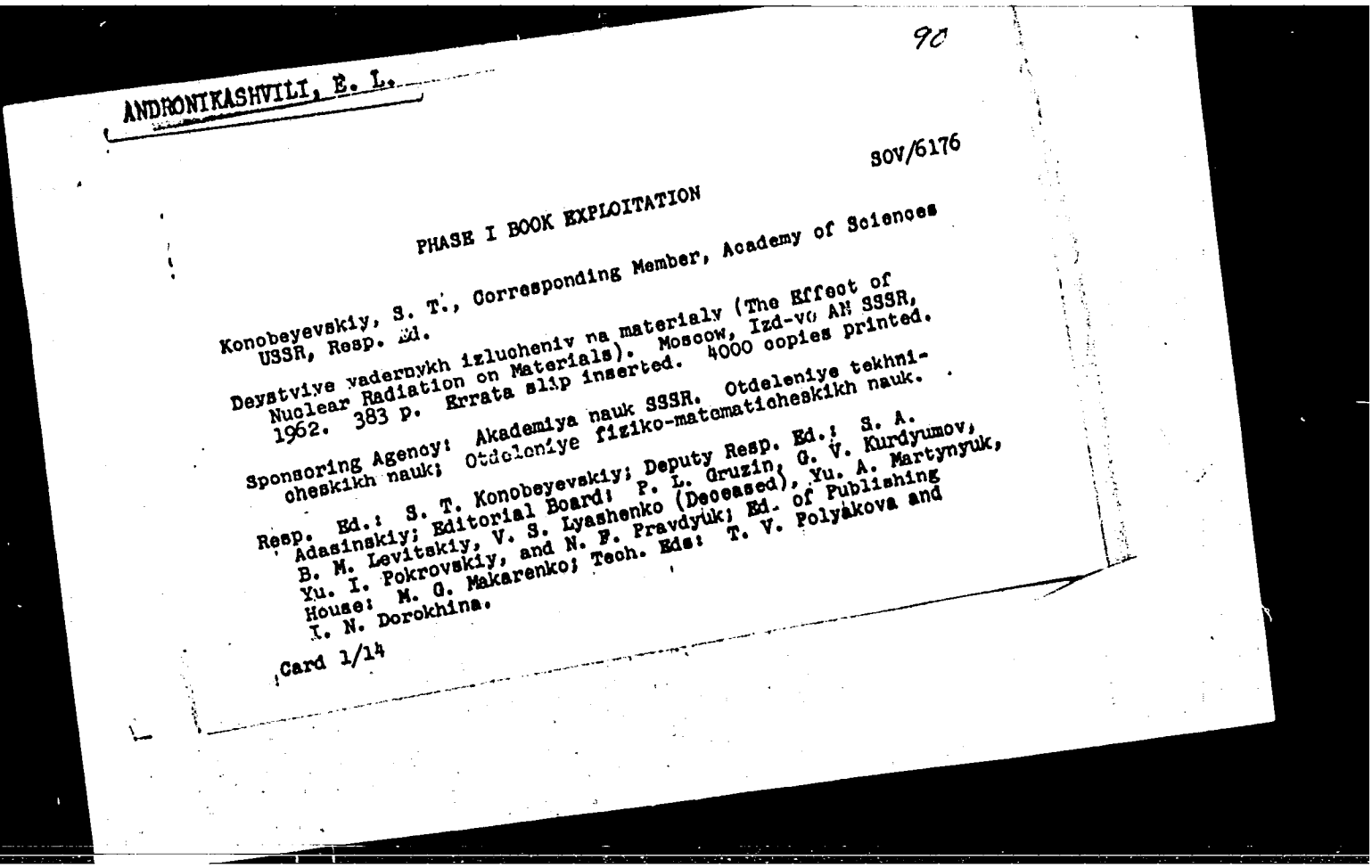

90

ANDRONIKASHVILI, E. L.

SOV/6176

PHASE I BOOK EXPLOITATION

Konobeyevskiy, S. T., Corresponding Member, Academy of Sciences USSR, Resp. Ed.

Deystviye vaderuykh izlucheniy na materialy (The Effect of Nuclear Radiation on Materials). Moscow, Izd-vo AN SSSR, 1962. 383 p. Errata slip inserted. 4000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye tekhnicheskikh nauk; Otdeleniye fiziko-matematicheskikh nauk.

Resp. Ed.: S. T. Konobeyevskiy; Deputy Resp. Ed.: S. A. Adasinskiy; Editorial Board: P. L. Gruzin, G. V. Kurdyumov, B. M. Levitskiy, V. S. Lyashenko (Deceased), Yu. A. Martynyuk, Yu. I. Pokrovskiy, and N. F. Pravdyuk; Ed. of Publishing House: M. G. Makarenko; Tech. Eds: T. V. Polyakova and I. N. Dorokhina.

Card 1/14

90

The Effect of Nuclear Radiation (Cont.) SOV/6176

PURPOSE: This book is intended for personnel concerned with nuclear materials.

COVERAGE: This is a collection of papers presented at the Moscow Conference on the Effect of Nuclear Radiation on Materials, held December 6-10, 1960. The material reflects certain trends in the work being conducted in the Soviet scientific research orginization. Some of the papers are devoted to the experimental study of the effect of neutron irradiation on reactor materials (steel, ferrous alloys, molybdenum, avial, graphite, and nichromes). Others deal with the theory of neutron irradiation effects (physico-chemical transformations, relaxation of internal stresses, internal friction) and changes in the structure and properties of various crystals. Special attention is given to the effect of intense Y-radiation on the electrical, magnetic, and optical properties of metals, dielectrics, and semiconductors.

Card 2/14

The Effects of Nuclear Radiation (Cont.) SOV/6176

Pravdyuk, N. F., Yu. I. Pokrovskiy, and V. I. Vikhrov. Effect of Neutron Irradiation on Internal Friction in Mono- and Polycrystals of Zinc 235

Zakharov, A. I. Effect of Neutron Irradiation and Plastic Deformation on Young's Modulus and Internal Friction 242

Konobeyevskiy, S. T., and F. P. Butra. Radiographic Effects in Neutron-Irradiated Crystals 251

Kolontsova, Ye. V. Radiation and Deformation Disturbances in Crystals 257

Telegina, I. V., Ye. V. Kolontsova and V. V. Zubenko. Radiation Disturbances in Crystals of Lithium Fluoride 264

Andronikashvili, E. L., N. G. Politov, and L. F. Vorozheykina. Effect of Lattice Disturbances on Mechanical and Optical Properties of Potassium Chloride Crystals. 268

Card 10/14

Andronikashvili, E. L., N. G. Politov, and M. Sh. Getiya. Effect of Irradiation in a Reactor on Structure and Hardness of Alkali-Halide Crystals 277
The irradiation was conducted in the IRT-2000 Reactor at the Physics Institute of the Georgian Academy of Sciences.

Orlov, A. N. Use of Electronic Computers for Calculating Radiation Disturbances in Metals 288

Dekhtyar, I. Ya., and A. M. Shalayev. Change in Physical Properties of Ferromagnetic Metals and Alloys Caused by γ-Radiation 294

Gevtsriken, S. D. (Deceased), and N. P. Plotnikova. Effect of γ-Irradiation on Processes of Ordering and Disordering in Fe-Al Alloys 306

Konozenko, I. D., V. I. Ust'yanov, and A. P. Galushka. γ-Conductivity of Cadmium Selenide 308

ACCESSION NR: AT3012967 S/2749/62/008/000/0209/0212

AUTHORS: Andronikashvili, E. L.; Tsakadze, D. S.

TITLE: Measurement of the frequency and damping of oscillations of a light disc immersed in rotating He-II

SOURCE: AN GruzSSR. Institut fiziki. Trudy*, v. 8, 1962, 209-212

TOPIC TAGS: superfluidity, helium II, superfluidity measurement, rotating disc method, disc frequency, disc oscillations, damping of disc oscillations, vortex filaments, quantum liquids

ABSTRACT: Axial-torsional oscillations of a disc immersed in rotating He-II and rotating uniformly at the same speed as the helium were investigated. This is a continuation of earlier work by the authors (Soobshcheniya AN GSSR, XX, 6, 688, 1958 and ZhETF, v. 37, (7), 322, 1959), but in the earlier investigations the damping or the frequency was negligible in one case and the frequency was negli-

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ACCESSION NR: AT3012967

gible in the other. The instrument developed for this purpose is described elsewhere (Trudy IF, AN GSSR v. 7, 64, 1960). The damping tests confirm the earlier results. The frequency variation of the disc as a function of the speed first increases linearly and then tends to saturation. It is pointed out as remarkable that the bend of the curve occurs in the frequency region corresponding to maximum damping. The curve for the frequency variation deviates from the theoretical at higher frequencies (and the discrepancy is attributed to the slipping of the vortex filaments). The experimental data confirm the assumption that the slip increases at velocities at which the effective radii of the vortices overlap, and the decrease in damping is due to the increased slipping of the vortices because of the collectivization of their oscillations. "The authors are grateful to K. B. Mesoyed and G. M. Gudzhabidze for help with the measurements and to Yu. G. Mamaladze and S. G. Matinyan for a discussion of the results of the experiment." Orig. art. has: 1 figure and 1 formula.

Card 2/3

ACCESSION NR: AT3012967

ASSOCIATION: Institut fiziki AN GruzSSR (Physics Institute, AN GruzSSR)

SUBMITTED: 00	DATE ACQ: 04Oct63	ENCL: 00
SUB CODE: PH	NO REF SOV: 008	OTHER: 001

Card 3/3

ANDRONIKASHVILI, E.L.

Symposium on the Preparation of Programs and the Use of Research Reactors. Atom. energ. 13 no.1:80-83 Jl '62. (MIRA 15:7)
(Nuclear reactors--Congresses)

L 2437-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/JG/GG/GS

ACCESSION NR: AT5023807 UR/0000/62/000/000/0268/0276

AUTHOR: Andronikashvili, E. L.; Politov, N. G.; Vorozheykina, L. F.

TITLE: Effect of lattice disturbances on the mechanical and optical properties of potassium chloride crystals

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izlucheniy na materialy. Moscow, 1960. Deystviye yadernykh izlucheniy na materialy (The effect of nuclear radiation on materials); doklady soveshchaniya. Moscow, Izd-vo AN SSSR, 1962, 268-276

TOPIC TAGS: potassium chloride, crystal lattice defect, F band, color center, irradiation effect, hardness, x ray irradiation, neutron irradiation, gamma irradiation

ABSTRACT: The paper presents initial results of studies undertaken at the Institut fiziki AN Gruz. SSR (Institute of Physics AN Gruz SSR) for the purpose of determining the relationship between various types of lattice disturbances and the hardness of alkali halide crystals. Various methods of inducing the disturbances were employed (additive coloring, x-irradiation, and irradiation with mixed neutron and gamma radiation in the IRT-2000 reactor). Additive and subtractive coloring of KCl single crystals caused a decrease in microhardness and

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L 2437-66

ACCESSION NR: AT5023807 O

scratch hardness; the latter was more sensitive to change in the number of F-centers than the former. Upon exposure to n, γ-radiation, the microhardness and scratch hardness behave differently as the dose increases. It is suggested that this irradiation causes, in addition to the formation of F-centers, new kinds of lattice disturbances which even at low concentrations mask the influence of F-centers on the microhardness effect. The hypothesis that the same defects may affect different types of hardness to different degrees is confirmed. Furthermore, situations arise where different types of hardness change in different directions under the same conditions. This indicates that each type of hardness has a predominant relationship with certain definite types of lattice disturbances. Studies of the influence of x-rays on the F-band intensity show that the number of F-centers changes in a complex manner with increasing irradiation time. Orig. art. has: 10 figures.

ASSOCIATION: none

SUBMITTED: 18Aug62 ENCL: 00 SUB CODE: SS, OP

NO REF SOV: 003 OTHER: 015

Card 2/2 hd

L 2438-66 EWT(l)/EWT(m)/EPF(c)/EPF(n)-2/T/EWP(t)/EWP(b)/EWA(c) IJP(c)
JD/JG/GG/GS

ACCESSION NR: AT5023808 UR/0000/62/000/000/0277/0287

AUTHOR: Andronikashvili, E. L.; Politov, N. G.; Getiya, M. Sh.

TITLE: Effect of reactor irradiation on the structure and hardness of alkali halide crystals

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izlucheniy na materialy. Moscow, 1960. (Deystviye yadernykh izlucheniy na materialy (The effect of nuclear radiation on materials); doklady soveshchaniya. Moscow, Izd-vo AN SSSR, 1962, 277-287

TOPIC TAGS: potassium chloride, lithium fluoride, crystal dislocation, hardness, irradiation effect, x ray irradiation, neutron irradiation, gamma irradiation

ABSTRACT: Potassium chloride and lithium fluoride single crystals were irradiated in the IRT-2000 reactor of the Institut fiziki AN Gruz. SSR (Institute of Physics, AN Gruz. SSR), in vertical experimental channel No. 5. The thermal neutron flux was $nv = 1.03 \times 10^{12}$ n/cm^2 sec. The dislocations were studied by etching. The dislocation density in KCl crystals is unaffected by the x-rays in the dose interval employed. Beginning at an integral dose of $\sim 10^{16}$ n/cm^2, the reactor irradiation causes the dislocation density to rise sharply. Long before the appearance of the first dislocations induced by the irradiation, the micro-

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ACCESSION NR: AT5023808

hardness of KCl and LiF crystals begins to increase with the irradiation time. Thermal treatment of irradiated LiF crystals at 250C restores the initial microhardness only partially, whereas thermal treatment at 500C reestablishes the original mechanical properties of the crystals completely. The dislocation density in irradiated samples remains unchanged as a result of annealing at 250C as compared to nonannealed samples. Consequently, dislocations which formed during irradiation may under certain conditions have no effect on the microhardness of the irradiated samples. Thermal treatment causes a decrease of dislocation density beginning at 350C. In LiF crystals annealed at 700C, no dislocations are observed with the aid of the technique employed, perhaps because they are completely masked by square pores. Orig. art. has: 9 figures.

ASSOCIATION: none

SUBMITTED: 18Aug62 ENCL: 00 SUB CODE: NP, SS

NO REF SOV: 000 OTHER: 003

Card 2/2

ANDRONIKASHVILI, E.L.; BUDA, B.G.; KIKNADZE, G.I.; FEL'DMAN, L.I.; CHANTURIYA, V.M.

Model of a radiative indium-gallium loop for the IRT-2000 reactor at Tbilisi. Atom. energ. 13 no.4:342-349 O '62. (MIRA 15:9)
(Nuclear reactors)

ANDRONIKASHVILI, E.

International Symposium on Radiation Damage to Solid Bodies and Reactor Materials. Atom.energ. 13 no.6:606-608 D '62.
(MIRA 15:12)

(Solids, Effect of radiation on—Congresses)
(Nuclear reactors—Materials)

S/048/62/026/005/019/022
B108/B102

3.2410

AUTHORS: Andronikashvili, E. L., Bibilashvili, M. F., Vardenga, G. D., Gvaladze, T. V., Dzhavrishvili, A. K., Kazarov, R. Ye. Kuridze, R. V., and Khaldeyeva, I. V.

TITLE: Angular distribution of the penetrating component of extensive atmospheric showers at a depth of 200 m water equivalent

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 5, 1962, 682-684

TEXT: The angular distribution of the axes of extensive atmospheric showers was determined by various methods, mainly using a cloud chamber. The direction of the axis was established from the electron-photon component. At a distance of 0.5H or less from the shower axis (H = depth at which the detector is placed under the surface), the particle distribution is given by $I_\vartheta = I_0 \cos^{8.3}\vartheta$, as has been established by various authors. The present authors' results agree with this law. There are 2 figures.

Card 1/1

S/056/62/043/004/060/061
B104/B186

Study of rotated He II near ...

detector were amplified and conducted into an ЭПП-09 (EPP-09) recorder. At temperatures around the λ-point (2.09 and 2.15°K) the resonance frequency was fixed in motionless He. The temperature of the He was then raised to 2.25°K by stopping evacuation. The resonator was set in motion (ω_o = 0.98 sec^{-1}), and after 3-4 minutes He was again pumped out at a rate of 2 mm Hg per minute. The amplitude of secondary sound was measured at the moment of passing the previously fixed temperature. The same measurements were also made with motionless He. The measurements at a fixed temperature of 2.15°K showed that the maximum amplitude of secondary sound does not change, i.e., the formation of vortices slows down. The amplitude becomes lower when the temperature is raised somewhat above the λ-point and is then again reduced to 2.15°K without the resonator being stopped. The measurements at fixed temperature of 2.09°K give another picture: at the first reduction of temperature the amplitude of secondary sound becomes lower by 20%. The same reduction is reached after 1.5 to 2 minutes rotation at the same angular velocity when the He is kept at a temperature of approximately 2.09°K. The time that elapsed before this slowed down the formation of Onsager-Feynman vortices is estimated to have been 4 minutes (at 2.15°K).

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S/056/62/043/004/060/061
Study of rotated He II near ... B104/B186

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics of the Academy of Sciences Gruzinskaya SSR)

SUBMITTED: August 31, 1962

Card 3/3

ANDRONIKASHVILI, E.L.

"Scientific policy and development of productive forces in the Georgian S.S.R."

Report submitted to the Conf. on the Application of Science and Technology for the Benefit of the Less Developed Areas.
Geneva, Switzerland 4-20 February 1963

ANDRONIKASHVILI, E. L.; BARNAVELI, T. T.; BIBILASHVILI, I. F.; GEGIASHVILI, G. A.; DZHAVRISHVILI, A. K.; KOZAROV, R. Ye., KURIDZE, R. V.; KHALDEYEVA, I. V.

Investigation of the properties of pentrating components at a depth of 200 mwe.

Report submitted for the 8th Intl. Conf, on Cosmic Rays (IUPAP), Jaipur, India, 2-14 Dec 1963.

ANDRONIKASHVILI, E.L.; BABLIDZE, R.A.; GUDZHABIDZE, G.V.;
TSAKADZE, D.S. (Tbilisi)

"Experimental study of generation and disappearance of vortices at a phase transition from a quantum liquid into a classical one and vice versa".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964

ACCESSION NR: AP4012537 S/0056/64/046/001/0157/0161

AUTHORS: Andronikashvili, E. L.; Mesoyed, K. B.; Tsakadze, Dzh. S.

TITLE: Possible existence of Onsager-Feynman vortices at temperatures above the Lambda point

SOURCE: Zhurnal eksper. i teoret. fiz., v. 46, no. 1, 1964, 157-161

TOPIC TAGS: Superfluidity, Helium II, Onsager Feynman vortices, quantum liquid, Lambda point, rotating helium, liquid helium

ABSTRACT: The vortex properties of rotating helium at temperatures directly above the λ point, observed by the authors in 1958 (E. A. Andronikashvili, Dzh. S. Tsakadze, Yu. G. Mamaladze, and S. G. Matinyan, Paper at Fifth All-Union Conference on Low-Temperature Physics, Tbilisi, 1958) was rechecked by an improved procedure and with equipment of increased precision and uniformity of motion. It is shown that in He I there is no dependence of the damping on the

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ACCESSION NR: AP4012537

speed of rotation, as expected of a classical liquid. However, if rotating He II is superheated above the λ point and pressure produced over it, the difference in damping not only does not equal zero, but also exhibits, as a function of the oscillation frequency, a characteristic maximum at the same angular velocities at which a maximum is observed below the λ point. This indicates that the effects connected with the existence of the Onsager-Feynman vortices continue to exist in the rotating liquid helium if the state above the λ point is obtained by superheating rotating He II. "The authors are grateful to Yu. G. Mamaladze for a discussion of the results and to G. V. Gudzhabidze for help with the measurements." Orig. art. has: 5 figures and 1 formula.

ASSOCIATION: Institut fiziki AN GruzSSR (Institute of Physics AN GruzSSR); Tbilisskiy Gosudarstvenny*y universitet (Tbilisi State University)

Card 2/3

ACCESSION NR: AP4012537

SUBMITTED: 06Aug63	DATE ACQ: 26Feb64	ENCL: 00
SUB CODE: PH	NO REF SOV: 007	OTHER: 002

Card 3/3

ANDRONIKASHVILI, E. L.; GUDZHABIDZE, G. V.; TSAKADZE, D. S.

"Relaxation of Onsager-Feynman's Vortices at Heating of Rotating Helium II above $T\lambda$."

report submitted for 9th Intl Conf on Low Temperature Physics, Columbus, Ohio, 31 Aug-4 Sep 64.

Inst of Physics, AS GSSR, Tbilisi.

ACCESSION NR: AT4016310 S/0000/62/000/000/0287/0303

AUTHOR: Andronikashvili, E.L.; Politov, N.G.; Mumladze, V.V.; Vorozheykina, L.F

TITLE: Plasticity and thermal conductivity of defective alkali halide crystals

SOURCE: Vses. soveshch. po fiz. shchelochnogaloidn. kristallov. 2d, Riga, 1961. Trudy* Fiz. shchelochnogaloidn. kristallov (Physics of alkali halide crystals). Riga, 1962, 287-303

TOPIC TAGS: alkali halide crystal, plasticity, thermal conductivity, F-center, reactor radiation, crystallography, radiation defect, crystal physical property, hardness

ABSTRACT: In an extension of the authors' previous work, the influence of F-centers on plasticity and the influence of reactor radiation on plasticity and thermal conductivity were examined in Kcl crystals. The influence of reactor radiation on plasticity was also examined in LiF crystals. F-centers were produced by x-raying in a RUP-200-20-4 unit and an IRT-200 reactor was used for neutron and gamma radiations. Hardness was measured by the scratching and the pendulum swing damping methods. Optical absorption spectra were measur-

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ACCESSION NR: AT4016310

ed with an SF-4 spectrophotometer and an assembly, based on the principles of A.V. Ioffe and A.F. Ioffe and constructed in the authors' laboratory, was used for the determination of thermal conductivity. This method was applicable at close-to-room temperatures and, in a 5 minute procedure, produced results with an accuracy of 3-5 per cent. At least one hundred samples were examined. Curves for the dependence of hardness on the duration of x-raying and the concentration of F-centers showed a steady growth of plasticity of KCl crystals for the duration of x-raying, accompanied by the accumulation of F-centers. Under the influence of reactor radiation KCl crystals showed an initial growth of microhardness, which ceases when a dose of $\sim 10^{16}$ neutron/cm^2 is reached. In contrast, the resistance to plastic deformation and mechanical strength continued to grow in LiF crystals. The thermal conductivity of KCl crystals under reactor radiation followed a complex pattern, showing an initial decrease, followed by an increase as radiation continued. Orig. art. has: 11 figures.

ASSOCIATION: Institut fiziki AN Gruzinskoy SSR (Institute of Physics, Academy of Sciences of the Georgian SSR)

Card 2/3

ACCESSION NR: AT4016310

SUBMITTED: 00 DATE ACQ: 06Mar64 ENCL: 00

SUB CODE: GP NO REF SOV: 010 OTHER: 013

Card 3/3

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000101420018-4"

ACCESSION NR: AT4016309 S/0000/62/000/000/0284/0286

AUTHOR: Andronikashvili, E.L.; Politov, N.G.; Getiya, M. Sh.

TITLE: Radiation generation of dislocations in alkali halide crystals

SOURCE: Vses. soveshch. po fiz. shchelochnogaloidn. kristallov. 2d, Riga, 1961. Trudy*. Fiz. shchelochnogaloidn. kristallov (Physics of alkali halide crystals). Riga, 1962, 284-286, plus 3 pages of illustrations following p. 286

TOPIC TAGS: alkali halide crystal, radiation defect, neutron irradiation, radiation, crystallography, crystal physical property

ABSTRACT: Glacial acetic acid saturated with zinc ions and water, respectively, were used for etching KCl and LiF monocrystals in a study of the effect of radiation on the dislocation density in the crystals. A RUP-200-20-4 emitter was used for the x-raying. The neutron-irradiation was effected at a thermal power of 1000 kw with a $1.03 \cdot 10^{12}$ neutron/cm^2.sec thermal neutron flow on the IRT-200 nuglear reactor of the Institut fiziki AN Gruzinskoy SSR (Physics Institute of the Georgian Academy of Sciences). Ten-hour x-ray tests were found to produce no effect on the dislocation density in the crystals, and only after 2 1/4 hrs. of neutron irradiation could the appearance of new con-

Card 1/2

ANDRONIKASHVILI, E.L., akademik; BUDA, B.G.; DEVNOZASHVILI, D.S.; KIKNADZE, G.I.; KITSMARISHVILI, E.S.; TOPSHYAN, L.S.; CHANTURIYA, V.M.

Low-temperature loop of an IRT-2000 reactor. Soob. AN Gruz. SSR 34 no.1:45-52 Ap'64 (MIRA 17:7)

1. AN Gruzinskoy SSR (for Andronikashvili).

ANDRONIKASHVILI, E.L.; POLITOV, N.G.; GETIYA, M.Sh.; VOROZHEYKINA, L.F.

Radiation damages in ionic crystals. Izv. AN SSSR. Ser.fiz. 29 no.3:366-370 Mr '65. (MIRA 18:4)

L 9294-66 EWT(l)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD/GG

ACC NR: AP5026407 SOURCE CODE: UR/0386/65/002/006/0278/0281

AUTHOR: Andronikashvili, E. L.; Tsakadze, D. S.

ORG: Institute of Physics, Academy of Sciences Georgian SSR (Institut fiziki Akademii nauk Gruzinskoy SSR)

TITLE: Dependence of the density of rotating liquid helium on the angular velocity

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 6, 1965, 278-281

TOPIC TAGS: liquid helium, quantum liquid, vortex

ABSTRACT: To ascertain the velocity dependence of the density of helium II, and to check on the assumption that the presence of vortex filaments "loosens up" rotating helium II, the authors undertook an experiment, in which a sensitive pycnometer was set in rotation (Fig. 1). The apparatus and procedure are described briefly. The instrument was sensitive enough to register changes in the sixth significant figure of the density. The measured dependence of the density of helium II on the rotary speed at constant temperature (Fig. 2) discloses the striking fact that when the helium II is twisted it becomes much denser, and the increase in density rises with the temperature and with the angular velocity. If helium-I is set in rotation at the same angular velocity, no change in pressure can be observed. It is concluded on this basis that some specific mechanism condensing the helium II exists. It is not connected with the presence of centrifugal pressure, but apparently with the

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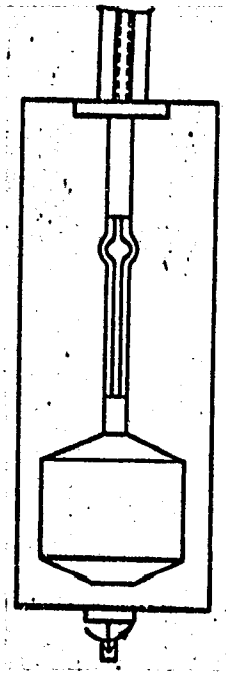
L 9294-66

ACC NR: AP5026407

existence of quantized vortices of the Onsager-Feynman type. It is also reported that a jump was observed in the density of the liquid helium as it goes through the phase transition point, thus offering evidence that during rotation the HeII-HeI phase transition is of first and not of second order. Authors thank Yu. G. Mamaladze for participating in the discussion of the results. Orig. art. has: 2 figures.



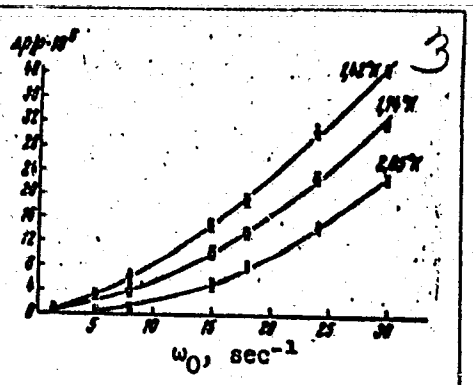


Fig. 2. Density of He II vs. rotary speed at several constant temperatures.

Fig. 1. Diagram of pycnometer.

21, 44, 55

SUB CODE: 20/ SUBM DATE: 23Jul65/ ORIG REF: 000/ OTH REF: 001

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L 22777-66 EWT(m)/EPF(n)-2/EWP(t)/EWA(h) IJP(c) JD/JG

ACC NR: AP6009716 SOURCE CODE: UR/0386/66/003/004/0173/0177

AUTHOR: Andronikashvili, E. L.; Bedbenova, D. S.; Politov, N. G.; Tsakadze, D. S.

ORG: Institute of Physics, Academy of Sciences, Georgian SSR (Institut fiziki Akademii nauk Gruzinskoy SSR)

TITLE: Scattering of cold neutrons in irradiated KBr and NaCl crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 4, 1966, 173-177

TOPIC TAGS: neutron scattering, sodium chloride, potassium bromide, single crystal, Gamma irradiation, crystal defect

ABSTRACT: In view of the current interest in the scattering of neutrons in irradiated alkali-halide single crystals, the authors irradiated KBr and NaCl single crystals with gamma rays from the In-Ga radiation loop in the reactor of the Georgian Academy Physics Institute. The dose rate was 0.8×10^6 r/hr. Before irradiation the crystal was cooled and placed in the path of a monochromated beam of neutrons. The resolution was 25% in terms of the wavelength, which ranged from 1 to 12 Å. The maximum background was 0.08 neut/cm^2. The sample thicknesses (6.3 mm for KBr and 2.2 mm for NaCl) were optimal from the point of view of the procedure for measuring neutron transparency;

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ACC NR: AP6009716

the transmission was 0.6—0.9 in the indicated wavelength interval. To suppress the inelastic scattering of neutrons by thermal lattice vibrations, the experiment was carried out at liquid-air temperature. The intensity of the neutron beam passing through the irradiated crystal was compared with the intensity through the same crystal prior to irradiation. Neutron scattering maximum was observed at wavelengths between 5 and 8 Å. The height of the maximum increased in proportion to the irradiation time. A similar curve was obtained also for 20 hours' exposure, but the measurement error was quite large. The scattering of neutrons by defects in irradiated crystals is even more strongly pronounced in NaCl crystals. The preliminary experiments have shown that at wavelengths corresponding to the maximum on the curve, the intensity of the neutrons scattered at an angle increases somewhat. To check whether the observed effect is connected with the occurrence of color centers in the irradiated single crystals of the alkali-halide salts, the concentration of F and M centers was measured in the wavelength interval 220—1000 nm. It was found that the maximum concentration of F-centers is 7×10^{17} cm^{-3}, and the number of M centers is much lower. Such small concentrations cannot explain the observed change in neutron transmission. The authors thank Professor Yu. M. Kagan for interest in the work and valuable discussions. Orig. art. has: 3 figures. [02]

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L 22116-66 EWT(d)/EWT(l)/EWT(m)/EPF(n)-2/EWP(t) IJP(c) JD/WW/GG
ACC NR: AP6004916 SOURCE CODE: UR/0056/66/050/001/0046/0050

AUTHORS: Andronikashvili, E. L.; Bablidze, R. A.; Tsakadze, Dzh.S.

ORG: Institute of Physics, Academy of Sciences, Georgian SSR (Institut fiziki Akademii nauk Gruzinskoy SSR) 53 51 B

TITLE: Damping of second sound in rotating helium II on going through the phase transition temperature

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 1, 1966, 46-50

TOPIC TAGS: liquid helium, quantum liquid, vortex, rotation, resonator, sound propagation, relaxation process

ABSTRACT: The purpose of the study was to investigate the formation of quantized Onsager-Feynman vortices in rotating helium, which has not been sufficiently studied to date, particularly in those cases when the vortices are formed in rotating helium going through the phase-transition temperature. For the purpose of investigating the kinetics of the vortex formation, the authors constructed a resonator

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in which second sound could propagate in a radial direction. A second axial resonator was constructed, in which the second sound could propagate along the axis of rotation. The experiments have shown that in the immediate vicinity of the phase transition point the rotating helium II becomes foglike, as a result of uniform distribution of vortex nuclei. It is deduced from the experiments that initially there is formed an isotropic mass of vortex nuclei, which gradually become aligned into a system of vortices oriented along the axis of rotation. The relaxation times were measured for different rotating speeds and for different degrees of supercooling, and it is concluded that the relaxation time of the classical type of motion in a rapidly rotating quantum liquid is of the same order as the time of formation of the quantized Onsager-Feynman vortices at large angular velocities. The authors thank Yu. G. Mamaladze for a discussion of the results and N. S. Gavrilidi for help with the experiments. Orig. art. has: 4 figures and 1 formula.

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Card 2/2 BK

L 22117-66 EWT(l)/EWT(m)/EEC(k)-2/T/EWP(t)/EWP(k) IJP(c) WG/JD
ACC NR: AP6004917 SOURCE CODE: UR/0056/66/050/001/0051/0054

AUTHORS: Andronikashvili, E. L.; Gudzhabidze, G. V.; Tsakadze, Dzh.S.

ORG: Institute of Physics, Academy of Sciences Georgian SSSR (Institut fiziki Akademii nauk Gruzinskoy SSR); Tbilisi State University (Tbilisskiy gosudarstvennyy universitet)

TITLE: Relaxation of the Onsager-Feynman vortices when rotating helium II is heated above the phase-transition temperature

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 1, 1966, 51-54

TOPIC TAGS: liquid helium, quantum liquid, vortex, rotation, critical point, relaxation process, temperature dependence

ABSTRACT: The decay of vortex lines in the superfluid component of rotating helium II, which occurs upon transition to helium I, was investigated by the oscillating disc method. Although it was expected from theoretical considerations that the vortex damping would appear at the phase transition temperature, the experiments have

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SUB CODE: 20/ SUBM DATE: 06Aug65/ ORIG REF: 006/ OTH REF: 002

Card 2/2 BK