TATARSKIY, N.V.

Late results in thoracoplasty. Probl.tub. 38 no.6:47-51 '60.
(MIRA 13:11)

1. Iz tuberkuleznogo otdeleniya (zav. - kand.med.nauk N.V. Tatarskiy) klinicheskogo otdela (zav. - prof. M.I. Khvilivitskaya) Leningradskogo instituta ekspertizy trudosposobnosti i organizatsii truda invalidov (dir. - kand.med.nauk P.A. Makkaveyskiy).
(CHEST--SURGERY)

TATARSKIY, N.V.

First Interprovince Conference on the Problems of Medical Disability Expertise and Rehabilitation of Invalids Disabled by Pulmonary Tuberculosis. Probl. tub. 41 no.9:82-83 '63
(MIRA 17:4)

TATARSKIY, N.V., kand.med.nauk (Leningrad, V.O.Gavanskaya ul., d.6,kv.15)

Late results of thoracoplasty in tuberculous empyema. Vest. khir. 90 no.3:35-41 Mr'63. (MIRA 16:10)

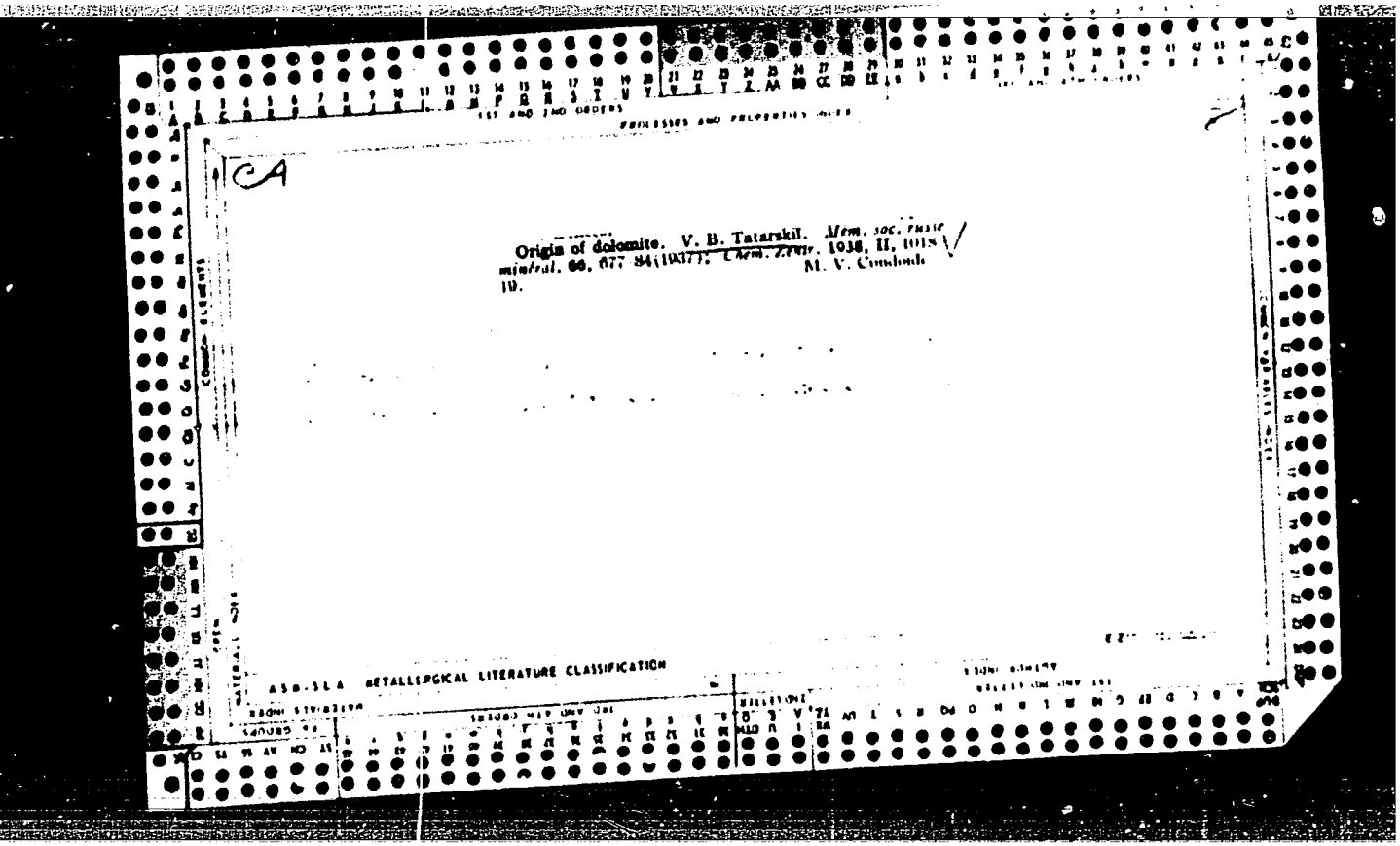
1. Iz tuberkuleznogo otdeleniya (zav. - N.V.Tatarskiy) klinicheskogo otdela (zav. - prof. M.I.Khvilivitskaya) Leningradskogo instituta ekspertizy trudosposobnosci i organizatsii truda invalidov (dir. - kand.med.nauk P.A.Makkaveyskiy).
(EMPYEMA) (TUBERCULOSIS)
(CHEST--SURGERY)

TATARSKIY, S. V. (DECEASED) 1963/1

c. 1956

FUELS

see ILC



CA

Calcite pseudomorphs after gaylussite. M. A. Plotnikov and V. B. Tatarskii. *Zapiski Vsesoyuznogo Mineral. Obshchestva* (Mem. soc. russe minéral.) 75, 234-40 (1946).—The pseudomorphs are observed in the Elvinskii horizon of the Tartarian formation, River Mezen Basin, chiefly pure carbonate sediments, with some pyrite, and opal in the lower layers. Typical monoclinic forms of gaylussite, $Na_2CO_3.CaCO_3.5H_2O$, are preserved; the crystals are several cm. thick, with (100), (011), (112), (010). The forms are very similar to the crystals from the Borax Lake, San Bernardino, Calif., and Soda Lake of Hagtown, Nevada, and the synthetic crystals from the Leblanc soda process. The temp. conditions of the gaylussite crystn. may have been those near 0°, in a cooling brine, or at higher temps., by evapn., with an upper stability limit of 40°, above which pirssonite, $Na_2CO_3.CaCO_3.2H_2O$, is formed.

W. Eitel

USSR/Minerals Jul/Aug/Sep 48
Bitumen
Analysis, Microscopic

"The Forms of Bitumen Deposits in Carbonate Rocks as Revealed Under the Microscope," V. B. Tatarskiy, Active Mem, Acad Sci USSR, 7 pp

"Zapiski V-S Mineral Obshch" Part 77, No 3

Results of microscopic studies of carbonate rocks form Khaudag and Uch-kizyl. Describes the morphology and methods for observing bitumens in microsections and presents some of the data obtained by these studies.

[redacted] 8/49T95

1. TATARSKIY, V. B.

2. USSR (600)

4. Physics and Mathematics

7. Crystallo-Optics and Immersion Method of Determination of a Substance, V. B. Tatarskiy. (Leningard, Press of the Leningrad University imeni A. A. Zhdanov, 1949). Reviewed by N. Ye. Vedeneyeva, Sov, Kniga, No.3, 1949.

9. [redacted] Report U- 3081, 16 Jan. 1953, Unclassified.

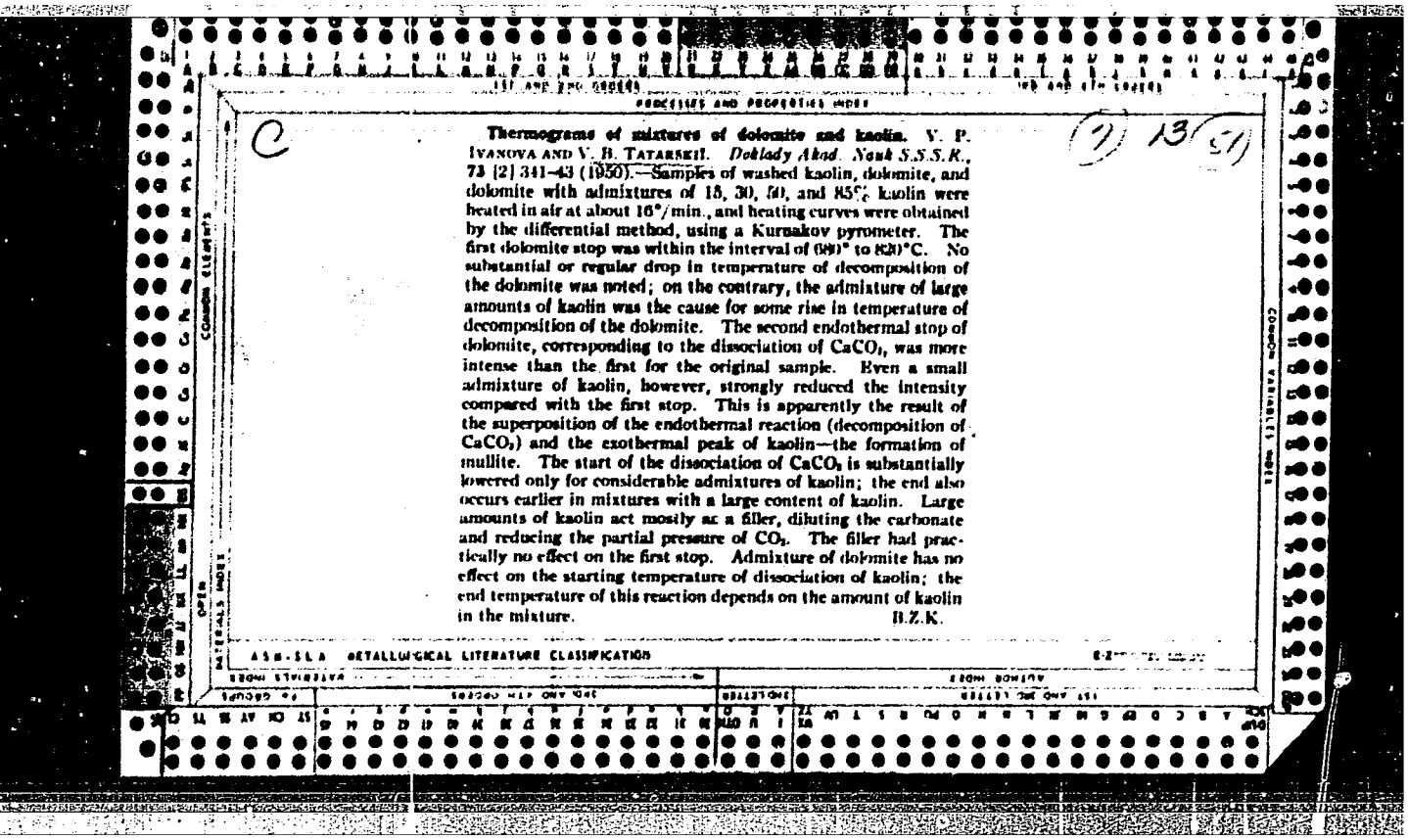
30755. TATARSKIY, V. B.

Ob okrashennoy poloske bekke. (Iz inostr. diteratury). Zapiski Vsesoyuz. mineral, o-va, 2-ya seriya, 1949, vyp. 3, s. 233-34.

CA

5

Dedolomitization of rocks. V. B. Tatarskii (A. A. Zhdanov State Univ., Leningrad). *Doklady Akad. Nauk S.S.S.R.* 69, 849-51(1949).—The change of dolomitic sediments to limestone is described from Bukhara, in the rocks of the Tadzhik depression. The process is a typical surface reaction: $CaCO_3.MgCO_3 + CaSO_4 \rightarrow 2CaCO_3 + MgSO_4$. Epsomite, assocd. with Na_2SO_4, is often observed on the surface of dedolomitized rocks, forming efflorescences. The petrographic character of the process is observed in all transitions from a beginning interpolation of calcite in fine-cryst. dolomite, to the complete replacement of the latter by a course-cryst., usually porous and cavernous limestone, with occasional relict inclusions of dolomite. Dedolomitization is also known from Palaeozoic rocks of Siberia, in the Kuban and Baku region. Often it has been described as the reverse process, i.e. as the change of limestone to dolomite, but the detailed microscopic studies of the typical reaction structures excludes every confusion. W. E.



Thermograms of mixtures of dolomite and kaolin. V. P. IVANOVA AND V. B. TATARSKII. *Doklady Akad. Nauk S.S.S.R.*, 73 [2] 341–43 (1950).—Samples of washed kaolin, dolomite, and dolomite with admixtures of 15, 30, 50, and 85% kaolin were heated in air at about 16°/min., and heating curves were obtained by the differential method, using a Kurnakov pyrometer. The first dolomite stop was within the interval of 680° to 820°C. No substantial or regular drop in temperature of decomposition of the dolomite was noted; on the contrary, the admixture of large amounts of kaolin was the cause for some rise in temperature of decomposition of the dolomite. The second endothermal stop of dolomite, corresponding to the dissociation of $CaCO_3$, was more intense than the first for the original sample. Even a small admixture of kaolin, however, strongly reduced the intensity compared with the first stop. This is apparently the result of the superposition of the endothermal reaction (decomposition of $CaCO_3$) and the exothermal peak of kaolin—the formation of mullite. The start of the dissociation of $CaCO_3$ is substantially lowered only for considerable admixtures of kaolin; the end also occurs earlier in mixtures with a large content of kaolin. Large amounts of kaolin act mostly as a filler, diluting the carbonate and reducing the partial pressure of CO_2. The filler had practically no effect on the first stop. Admixture of dolomite has no effect on the starting temperature of dissociation of kaolin; the end temperature of this reaction depends on the amount of kaolin in the mixture. B.Z.K.

TATARSKIY, V. B.

"Methods of Determining Rock-Forming Carbonate Minerals," (Metody Opredeleniya Porodoobrazuyu Shchikh Karbonatnykh Mineralov), Release #53, 1952.

This book contains works of the All-Union Petroleum Scientific Research Geological-Prospecting Institute (UNIGRI)

TABCON - D 163098, 14 Jan 55

TATARSKIY, V.B. [author]; SHUBNIKOV, A.V., deystvitel'nyy chlen [reviewer].

V.B.Tatarskii's law of the ellipsoid ("Crystallo-optics and the immersion method of identifying matter." V.B.Tatarskii. Reviewed by A.V.Shubnikov). Zap.Vses.min.ob-va 82 no.3:235 '53. (MLRA 6:11)
(Crystallography) (Tatarskii, V.B.)

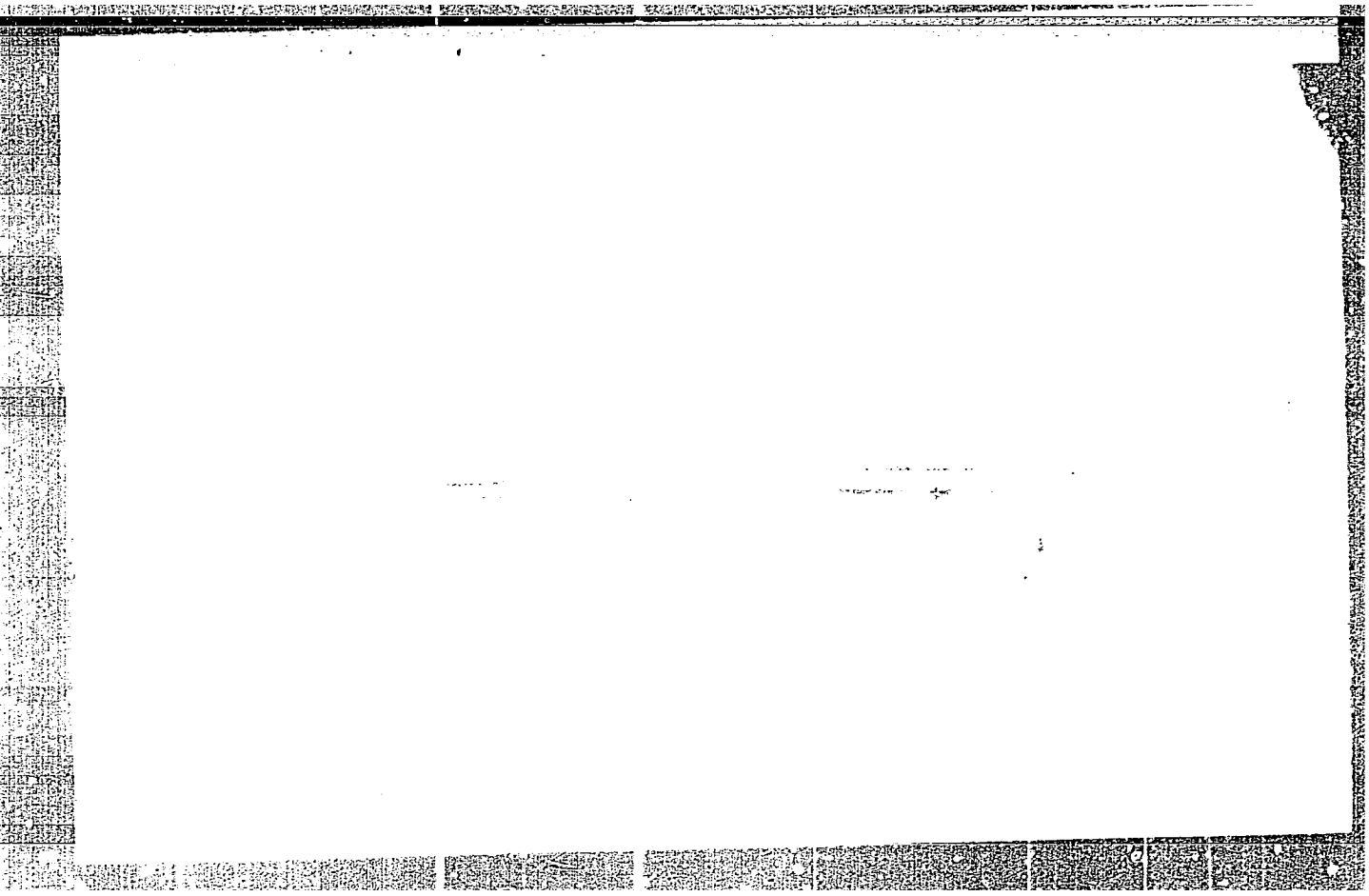
TATARSKIY, V.B.

Table for identifying forms of cleavage, axial system, and syngony of minerals in immersion. Zap.Vses.min.ob-va 82 no.4:283-285 '53. (MLRA 7:1)

1. Deystvitel'nyy chlen Vsesoyuznogo Mineralogicheskogo obshchestva.
(Crystallography)

SARANCHINA, Galina Mikhaylovna; KELAREV, L.A., redaktor; TATARSKIY, V.B., redaktor; BODOLAGINA, S.D., tekhnicheskiy redaktor.

[The Fedorov method] Fedorovskii metod. Leningrad, Izd-vo Leningradskogo universiteta, 1954. 134 p. (MIRA 8:5)
(Crystallography)



APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755110012-8"

15-57-5-6677

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 5, p 143 (USSR)

AUTHOR: Tatarskiy, V. B.

TITLE: Origin of Petroleum in the Bukhara Stage /K probleme genezisa nefti (Proiskhozhdeniye nefti bukharskogo yarusa)/

PERIODICAL: Vest. Leningr. un-ta, 1954, Nr 7, pp 181-187

ABSTRACT: Bibliographic entry

Card 1/1

TATARSKIY, V.B., deystvitel'nyy chlen.

An observation on the law of the ellipsoid. Zap.Vses.min.ob-va 83 no.1:78-79 '54. (MLRA 7:3)

1. Leningradskiy Gosudarstvennyy universitet im. A.A.Zhdanova, Kafedra kristallografii. (Crystallography)

TATARSKIY, Vitaliy Borisovich; IVANOV, A.S., redaktor; IONINA, I.N., vedushchiy redaktor; GENAD'YEVA, I.M., tekhnicheskiy redaktor.

[Microscopic determination of carbonates of the calcite and aragonite group] Mikroskopicheskoe opredelenie karbonatov grupp kal'tsita i aragonita. Leningrad, Gos.nauchn-tekhn.izd-vo neftianoi i gorno-toplivnoi lit-ry. Leningradskoe otd-nie, 1955.61 p. (MLRA 8:3)
(Carbonates (Mineralogy))

TATARSKIY, V.B.

Relation between refraction indices of trigonal carbonates. Uch.zap. Len.un no.188:117-128 '55. (MLRA 9:8)
(Refraction) (Carbonates (Mineralogy))

TATARSKIY,V.B.

Petrographic types, comparison, and formative conditions of the Bokhara stage in the Tajik Depression. Uch.zap.Len.un. no.189: 90-105 '55. (MLRA 8:12)
(Tajik Depression--Geology, Stratigraphic)

TATARSKIY, V.B.; FRANK-KAMENETSKIY, V.A.

Osip Markovich Ansheles; on the occasion of his 70th birthday.
Vest.Len.un. 10 no.10:117-122 O '55. (MLRA 9:1)
(Ansheles, Osip Markovich, 1885-)

TATARSKIY, V.B.

Determination of the number of plagioclase by immersion method. Zap.Vses.min.ob-va 85 no.2:204-208 '56. (MLRA 9:9)

(Feldspar)

TATARSKIY, V.B.; FRANK-KAMENETSKIY, V.A.; BURAKOVA, T.N.; NARDOV, V.V.; PETROV, T.G.; KONDRAT'YEVA, V.V.; KAMENTSEV, I.Ye.; CHERNYSHEVA, V.F.; ALEKSEYEVA, N.P.; ARTSYBASHEVA, T.F.; BARANOVSKAYA, N.I.; BUSSEN, I.V.; VERESHCHETSKO, I.A.; GNEVUSHEV, M.A.; GOYKO, Ye.A.; KOMKOV, A.I.; KOTOVICH, V.A.; LITVINSKAYA, G.P.; MIKHEYEVA, I.V.; MOKIYEVSKIY, V.A.; PETROVA, L.V.; POPOV, G.M.; SAFRONOVA, G.P.; SOBOLEVA, V.V.; STULOV, N.N.; TUGARINOVA, V.G.; SHAFRANOVSKIY, I.I.; SHTERNBERG, A.A.; YANULOV, K.P.

O.M. Ansheles; obituary. Vest. LGU 12 no.18:152-154 '57. (MIRA 11:3)
(Ansheles, Osip Markovich, 1885-1957)

TATARSKIY, V.B.

GRIGOR'YEV, D.P.; BONSHTEDT-KUPLETSKAYA, E.M.; GRITSAYENKO, G.S.; MIKHEYEV, V.I. [deceased]; TATARSKIY, V.B.

From the Commission of New Minerals of the All-Union Mineralogical Society. Zap. Vses. min. ob-va 86 no.2:315-316 '57. (MLRA 10:6)

1. Predsedatel' Leningradskogo gornogo instituta (for Grigor'yev and Mikheyev). 2. Institut geologii rudnykh mestorozhdeniy, petrografii, mineralogii i geokhimii Akademii nauk SSSR, Moskva (for Bonshtedt-Kupletskaya and Gritsayenko). 3. Leningradskiy gosudarstvennyy universitet (for Tatarskiy).

(Mineralogical societies)

RUKHIN, Lev Borisovich, prof., doktor geologo-mineralogicheskikh nauk, red.; SERDYUCHENKO, D.P., prof., doktor geologo-mineralogicheskikh nauk, red.; TATARSKIY, Vitaliy Borisovich, prof., doktor geologo-mineralogicheskikh nauk, red.; KALINKO, M.K., kandidat geologo-mineralogicheskikh nauk, red.; RENGARTEN, N.V., kandidat geologo-mineralogicheskikh nauk, red.; RUSAKOVA, L.Ya., vedushchiy red.; YASHCHURZHINSKAYA, A.B., tekhn.red.

[Reference manual on the petrography of sedimentary rocks; two volumes] Spravochnoe rukovodstvo po petrografii osadochnykh porod; v dvukh tomakh. Leningrad, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, Leningr. otd-nie. Vol.1. [Conditions of formation, characteristics and minerals of sedimentary rocks] Usloviia obrazovaniia svoistva i mineraly osadochnykh porod. 1958. 485 p. Vol.2. [Sedimentary rocks] Osadochnye porody, 1958. 519 p. (MIRA 11:2)
(Rocks, Sedimentary)

SOV/136-58-10-14/27

AUTHORS: Kompaniyets, M.F. and Tatarskiy, V.B.

TITLE: On the Mechanism of the Formation of Grains by Technical Aluminium Hydroxide (O mekhanizme obrazovaniya zeren tekhnicheskoy gidrookisi alyuminiya)

PERIODICAL: Tsvetnyye Metally, 1958, Nr 10, pp 67 - 69 (USSR)

ABSTRACT: The author examined specimens of technical aluminium hydroxide from the Ural' Aluminium Works and the Tikhvin Alumina Works with the aid of a polarising microscope, using thin sections. They conclude that the material consists mainly of spheroidal aggregates which are for the most part coarsely crystallised. The aggregates show characteristic growth directions from a common centre - they are not crystal aggregates formed by collision; occasionally two-centre aggregates are found. The structure of the technical hydroxide suggests that although they are made up of separate single crystals, this is the result of their having grown from a poly-crystalline nucleus and not of reaction during collision between independently growing crystals. The hydroxide crystals are mostly deformed, the degree of deformation being less for the large grains than for crystals in the small and

Card1/2

On the Mechanism of the Formation of Grains by Technical Aluminium Hydroxide

medium fractions: the latter thus have a higher internal and surface energy. The hydroxide structure was found to be non-uniform, with deleterious intra-crystalline inclusions of mother-liquor.
There are 2 figures and 5 references, 4 of which are Soviet and 1 German.

ASSOCIATIONS: Ural'skiy alyuminiyevyy zavod (Ural Aluminium Works) and Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SOV/70-3-5-23/24

AUTHORS: Shafranovskiy, I.I., Stulov, N.N., Tatarskiy, V.B. and Frank-Kamenetskiy, V.A.

TITLE: Certain Observations in Connection with the Article of Academician N.V. Belov "On a Course of Geometrical Crystallography for Physicists" (Neskol'ko zamechaniy po povodu stat'i Akad. N.V. Belova "O kurse geometricheskoy kristallografii dlya fizikov")

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 5, pp 637-638 (USSR)

ABSTRACT: Complaints by Leningrad mineralogists against the excessive physical bias by Belov in his article. There are 4 references, 2 of which are Soviet and 2 German.

ASSOCIATION: Leningradskiy gornyy institut. Leningradskiy gosudarstvennyy universitet.
(Leningrad Mining Institute and Leningrad State University)

SUBMITTED: May 23, 1958

Card 1/1

TATARSKIY, VITALIY BORISOVICH

"Determination and Study of Crystals by the Immersion Method"
A report presented at Symposium of the International Union Conference of Crystallography Lenningrad 21-27 My 1959

SO: B 3,135, 471 28 July 1959

TATARSKIY, V.B.

Nomenclature and classification of carbonates according to the size of grains. Vest. LGU 14 no.24:5-10 '59. (MIRA 12:12)
(Carbonates (Mineralogy)--Classification)

IOFFE, Boris Veniaminovich. Prinimali uchastiye: TATARSKIY, V.B., prof.; FRENKEL', S.Ya., starshiy nauchnyy sotrudnik; RYSKIN, Ya.I., nauchnyy sotrudnik; SVERDLOVA, O.V., mladshiy nauchnyy sotrudnik; RAVDEL', A.A., red.; SHEYNINA, G.A., red.; EHLIKH, Ye.Ya., tekhn.red.

[Refractometric methods in chemistry] Refraktometricheskie metody khimii. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1960. 382 p. (MIRA 14:2)

1. Leningradskiy universitet (for Tatarskiy). 2. Institut vysokomolekulyarnykh soyedineniy AN SSSR (for Frenkel'). 3. Institut khimii silikatov AN SSSR (for Ryskin).
(Refractometry)

TATARSKIY, V.B.

Number of accidental oriented crystals required for principal refractive indices. Zap. Vses. min. ob-va 89 no.1:94-96 '60.
(MIRA 13:10)

(Refractive index) (Crystals)

KUKHARENKO, Aleksandr Aleksandrovich; TATARSKIY, V.B., red.; POSPELOVA, A.M., red. izd-va; GUROVA, O.A., tekhn. red.

[Mineralogy of placer deposits] Mineralogiia rossypei. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po geologii i okhrane nedr, 1961. 316 p. (MIRA 14:11)

(Mineralogy)

TARUSHKOVA, N.N.; KUKHARENKO, A.A.; TATARSKIY, V.B., red.; GOL'DBERG, R.Ya., red. izd-va; GUROVA, O.A., tekhn. red.

[Atlas of placer minerals] Atlas mineralov rossypei. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po geol. i okhrane nedr, 1961. 435 p. (MIRA 14:11)

(Minerals)

TATARSKIY, V.B.

Index of refraction of biaxial crystals in the articles on mineralogy. Zap.Vses.min.Ob-va 90 no.4:486-488 '61. (MIRA 14:9)

1. Leningradskiy gosudarstvennyy universitet.
(Mineralogy, Determinative)

GRIGOR'YEV, D.P.; BONSHTEDT-KUPLETSKAYA, E.M.; BORNEMAN-STARYNKEVICH, I.D.; GEITSAYENKO, G.S.; TATARSKIY, V.B.; FRANK-KAMENETSKIY, V.A.

To all mineralogists of the Soviet Union. Zap.Vses.min.ob-va 90 no.5:607-608 '61. (MIRA 14:10)

1. Predsedatel' Komissii po novym mineralam Vsesoyuznogo mineralogicheskogo obshchestva (for Grigor'yev). 2. Komissiya po novym mineralam Vsesoyuznogo mineralogicheskogo obshchestva (for all).
(Mineralogical societies)

TATARSKIY, V.B.

Reduction of goniometric data on crystals to a single principal meridian. Zap.Vses.min.ob-va 90 no.6:691-695 '61. (MIRA 15:2)
(Crystallography) (Goniometry)

TATARSKIY, V.B.

MIN-8 and MP-6 polarizing microscopes. Zap. Vses. min. ob-va 92 no.5:608-612 '63. (MIRA 17:1)

SHAFRANOVSKIY, I.I.; BELOV, N.V.; BOKIY, G.B.; GRIGOR'YEV, D.P.; STULOV, N.N.; MOKIYEVSKIY, V.A.; TATARSKIY, V.B.; MIKHEYEVA, I.V.; DOLIVO-DOBROVOL'SKAYA, G.M.

Georgii Mikhailovich Popov; obituary. Zap. Vses. min. ob-va 92 no.5:613-615 '63. (MIRA 17:1)

TATARSKIY, V.B.

Note on S.Sh.Gendelev's article "Face morphology of yttrium ferrate crystals." Kristallografiia 9 no.1:132 Ja-F '64. (MIRA 17:3)

ACCESSION NR: AP4039414 S/0070/64/009/003/0451/0454

AUTHOR: Tatarskiy, V. B.

TITLE: The lack of any example of optically active crystals with planes of symmetry

SOURCE: Kristallografiya, v. 9, no. 3, 1964, 451-454

TOPIC TAGS: optical activity, symmetry plane, polarization plane, enantiomorphism

ABSTRACT: Using symmetry phenomena and giving no regard to position of elements in a crystal, it is easily shown that rotation of the polarization plane is incompatible with the existence of an inversion center and of the axes $\bar{3}$ and $\bar{6}$ in the crystal. It is also elementary to prove that rotation is impossible for the direction normal to the symmetry plane and for any direction lying in the plane. However, these analyses do not forbid optical activity in directions obliquely inclined to m and $\bar{4}$. There are thus 15 classes of crystals in which rotation of the polarization plane appears possible: 11 enantiomorphic and four others, represented by m, 2mm, $\bar{4}$, and $\bar{4}2m$. Of the last four, only the class m has a representative claimed by

Card 1/2

ACCESSION NR: AP4039414

investigators actually to show rotation of the polarization plane. This representative is the organic polymer $(C_9H_{12}O_4)_2$, but the author finds no satisfying evidence of this, believing that no actual crystal of this class has been found to rotate the polarization plane. He points out, also, that most of the other claims for optical activity in the remaining 11 enantiomorphic groups are based on improper interpretation of optical figures, the presence of defects, twinning, other imperfections in crystals, or to the inadequacy of the optical system of the microscope. Thus, though theoretically possible, experimental evidence of optical activity is lacking. Orig. art. has: 1 figure.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University)

SUBMITTED: 10Jun63 ENCL: 00

SUB CODE: SS, OP / NO REF SOV: 002 OTHER: 012

Card 2/2

TATARSKIY, Vitaliy Borisovich; KUKHARENKO, A. I., red.

[Crystal optics and the immersion method for studying] Kristallooptika i immersionnyi metod issledovaniia mineralov. Moskva, Nedra, 1965. 305 p. (MIRA 18:12)

YANOV, E.N.; STRAKHOV, N.M.; KRASHENNIKOV, G.F.; ARUSTAMOV, A.A.; GEYSLER, A.N.; GRAMBERG, I.S.; LIBROVICH, V.L.; MIKHAYLOV, B.M.; NEKRASOVA, O.I.; PISARCHIK, Ya.K.; POLOVINKINA, Yu.I.; TATARSKIY, V.B.; SHUMENKO, S.I.

Reviews and discussions. Lit. i pol. iskop. no.6:85-89 and 91-119 N-D '65. (MIRA 18:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologicheskiy institut, Leningrad. (for Yanov). 2. Geologicheskiy institut AN SSSR, Moskva. Submitted July 12, 1965 (for Strakhov). 3. Moskovskiy gosudarstvennyy universitet (for Krashennikov). 4. Kazakhskiy nauchno-issledovatel'skiy institut mineral'nogo syr'ya, g. Alma-Ata (for Arustamov).

ALYAVDIN, V.F.; BONSHTEDT-KUPLETSKAYA, E.M.; GODLEVSKIY, M.N., doktor geol.-mineral.nauk; KOMKOV, A.I.; KUKHARENKO A.A., prof.; SAL'DAU, E.P.; SMOL'YANINOVA, N.N.; BORNEMAN-STARYNKEVICH, I.D.; TATARSKIY, V.B., prof.; FRANK-KAMENETSKIY, V.A.

From the Commission on New Minerals of the Minerological Society of the U.S.S.R. Zap.Vses.min.ob-va 94 no.5:555-565 '65. (MIRA 18:11)

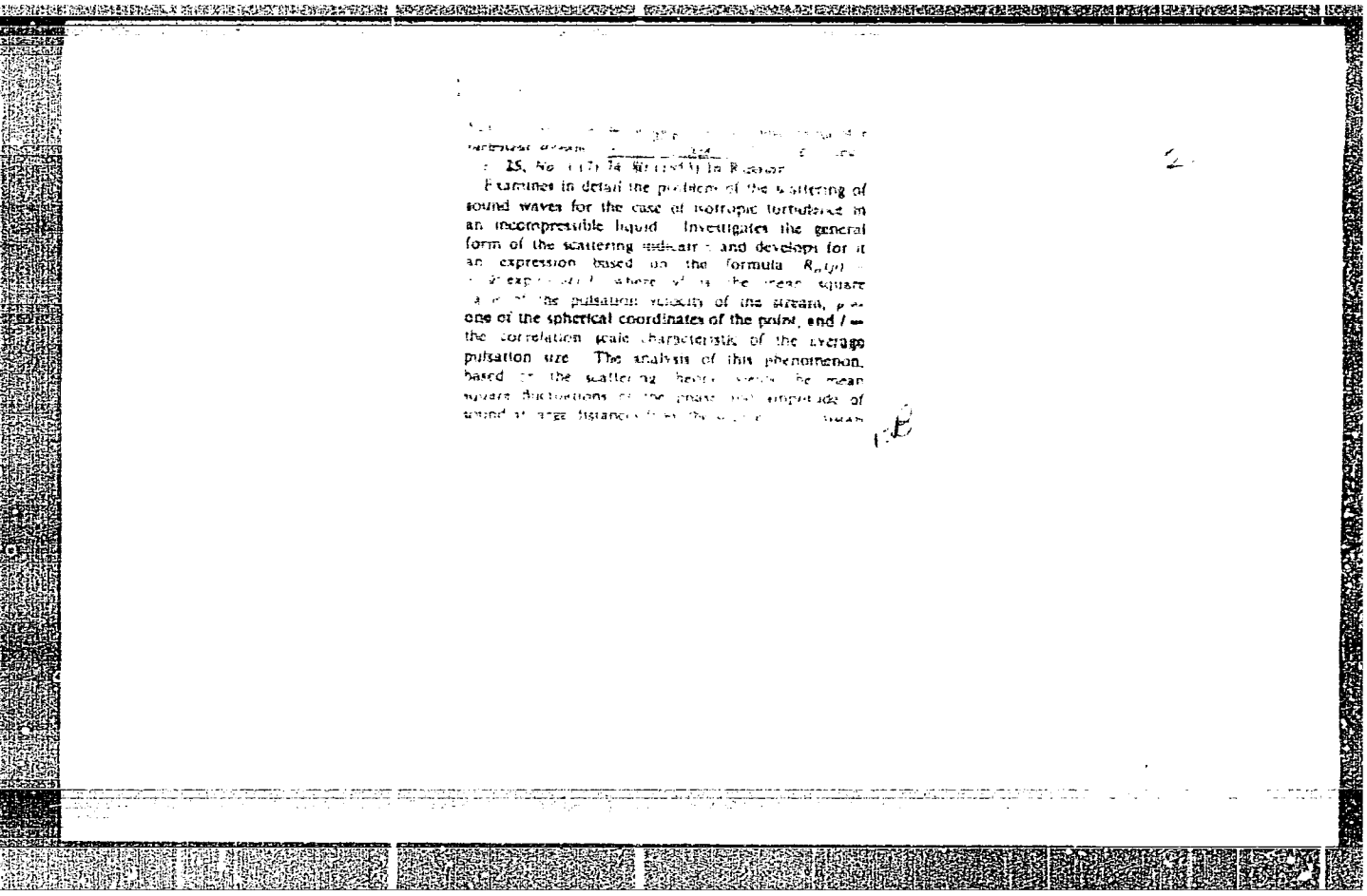
1. Komissiya po novym mineralam Vsesoyuznogo mineralogicheskogo obshchestva. 2. Predsedatel' Komissii po novym mineralam Vsesoyuznogo mineralogicheskogo obshchestva (for Frank-Kamenetskiy). 3. Zamestitel' predsedatelya Komissii po novym mineralam Vsesoyuznogo mineralogicheskogo obshchestva (for Bonshtedt-Kupletskaya). 4. Sekretar' Komissii po novym mineralam Vsesoyuznogo mineralogicheskogo obshchestva (for Sal'dau).

Mathematical Reviews
Vol. 15 No. 2
Feb. 1954
Mechanics

Tatarskiĭ, V. I. On the fluctuations of phase of sound in a turbulent medium. *Izvestiya Akad. Nauk SSSR. Ser. Geofiz.* 1953, 252–258 (1953). (Russian)

This paper considers the question of fluctuations of phase of sound received by two microphones situated in a turbulent medium. The mean quadratic fluctuations of the difference of phases is computed for an arbitrary relation between a quantitative base and the distance traversed by the sound in the turbulent medium. Treatment of the question is carried out within the framework of geometrical acoustics.

Author's summary.



Examines in detail the problem of the scattering of sound waves for the case of isotropic turbulence in an incompressible liquid. Investigates the general form of the scattering coefficient and develops for it an expression based on the formula $R_n(\rho) = \ldots \exp(-\rho/l)$, where v^2 is the mean square ... of the pulsation velocity of the stream, ρ — one of the spherical coordinates of the point, and l — the correlation scale characteristic of the average pulsation size. The analysis of this phenomenon, based on the scattering ... mean square fluctuations of the phase and amplitude of sound at large distances ...

TATARSKIY, V. I.

USSR .

§24. Criterion of the applicability of geometrical optics to problems of the propagation of waves through a medium characterized by slight refractive index variations. V. I. TATARSKII. *Zh. eksper. teor. Fiz.*, 25, *No.* 1 (7) 84–6 (1953) In Russian.

Ellison's method [Abstr. 1553 (1952)] is used for obtaining a more general criterion ensuring the coincidence of wave-functions resulting from the solutions of the two fundamental equations involved. It is shown that conditions $\lambda < l$, and $\lambda L < l^2$ (where λ is the length of the propagated wave, l is the mean size of inhomogeneities, and L is the path of wave in the inhomogeneous medium) are sufficient for ensuring the coincidence of both the amplitudes and phases in the geometrical and wave solutions.

F. LACHMAN

USSR.

260T89

TATARSKIY, V. I.

USSR/Physics - Sound Scattering 11 May 53

"Scattering of Sound in Turbulent Flow," V. A. Krasil'nikov and V. I. Tatarskiy, Sci-Res Inst of Physics, Moscow State U

DAN SSSR, Vol 90, No 2, pp 159-162

Analyzes scattering of sound as sum of scattering by pulsations of flow and by thermal inhomogeneity. Assumes that scattering of sound is responsible for damping of infrasound in the atmosphere. Presented by Acad M. A. Leontovich 16 Mar 53.

260T89

TATARSKIY, V. I.

USSR/Geophysics - Conference

Card 1/1 : Pub 44-10/11

Author : Kirillov, F.

Title : Chronicles. Conference of young scientists of the Geophysics Institute, Academy of Scientists of the USSR

Periodical : Izv. AN SSSR, Ser. geofiz., 495-496, Sep-Oct 1954

Abstract : May 17-20, 1954, the Geophysics Institute held a conference at which junior scientific workers participated with 18 reports; eg.g. Ye. A. Lyubimova (heating of the Earth), S. L. Solov'yev (intensity of earthquakes in Turkmenia 1912-1951), S. A. Fedotov (wave hodographs), Yu. I. Vasil'yev (use of amplitude data in seismic prospecting), O. G. Shamina (elastic impulses during collapse of rocks in earthquakes), O. I. Silayeva (velocity of propagation of elastic waves in granite, marble, etc.), V. I. Tatarskiy (propagation of waves in medium with random weak inhomogeneity of refraction coefficient), L. P. Zaytsev (reflection of waves from boundary). A. S. Chaplygina (measuring the thermobaric field in the atmosphere by statistical treatment of empiric data).

Institution : --

Submitted : --

ACCESSION NR: AP4031164 S/0056/64/046/004/1399/1411

AUTHOR: Tatarskiy, V. I.

TITLE: Propagation of electromagnetic waves in a medium with strong dielectric-constant fluctuations

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1399-1411

TOPIC TAGS: dielectric constant, electromagnetic radiation, electromagnetic scattering, electromagnetic wave diffraction, correlation, longitudinal wave, multiple scattering

ABSTRACT: The results of an earlier paper (with M. Ye. Gertsenshteyn, ZhETF, v. 44, 676, 1963), where the scalar wave equation was considered for the case ka<< 1 (k--propagation constant, a — correlation radius of the fluctuations of the medium), are extended to include Maxwell's equation. Expressions are derived for the averaged Green's function of the electromagnetic field in an unbounded medium with strong fluctuations of the dielectric constant; the case ka >> 1 is also considered, and a more consistent treatment is given of the field fluctuations. The analysis is restricted to a monochromatic source proportional to exp(iωt), and it is assumed that the medium has unity permeability, zero conductivity, and a dielectric

Card 1/2

ACCESSION NR: AP4031164

constant which is a random function of the coordinate. For ka << 1 the result reduces to a variation of the propagation constant and to the appearance of longitudinal waves. For ka >> 1, the additional attenuation of the average field does not reduct to a change in k. The mean square field fluctuation is also computed for ka << 1 and is found to be smaller than the value obtained in the first-approximation perturbation theory if multiple scattering is taken into account. In view of the inaccuracy of perturbation theory when it comes to strong fluctuations of the dielectric constant in the medium, the diagram technique of field theory is employed. Orig. art. has: 11 figures and 36 formulas.

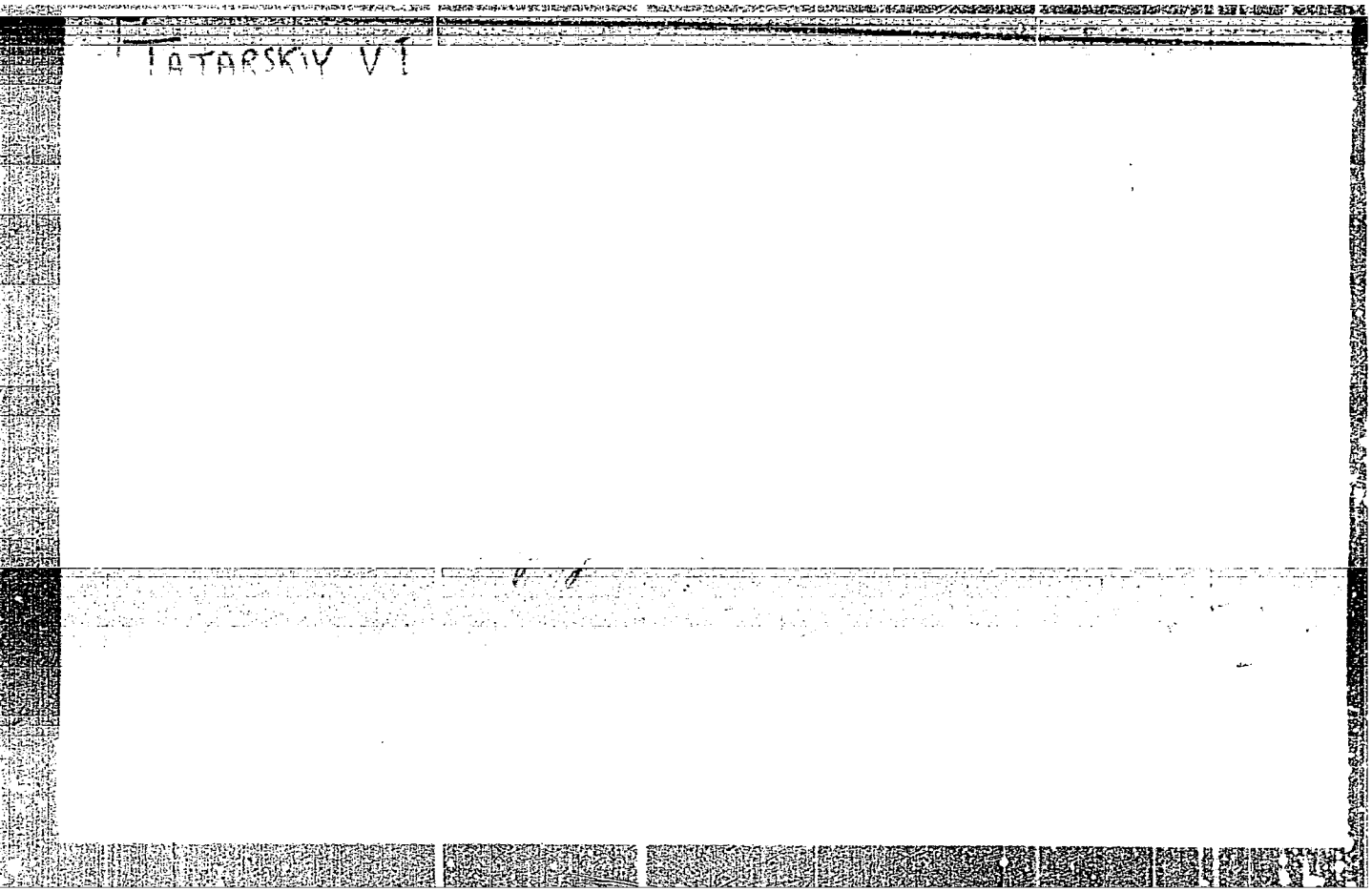
ASSOCIATION: Institut fiziki atmosfery* Akademii nauk SSSR (Institute of the Physics of the Atmosphere, Academy of Sciences SSSR)

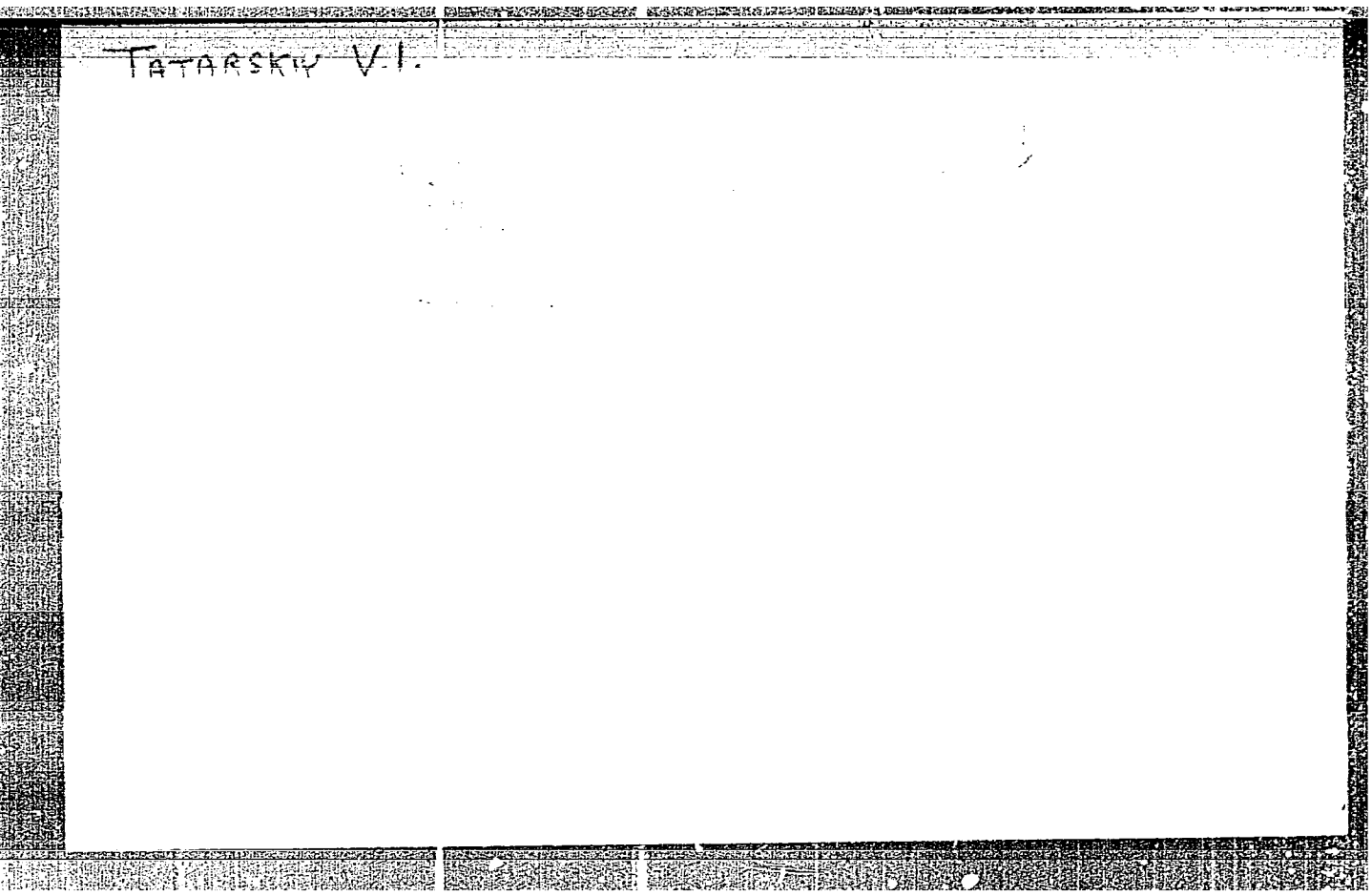
SUBMITTED: 14Oct63 DATE ACQ: 07May64 ENCL: 00

SUB CODE: AS, EM NR REF SOV: 001 OTHER: 002

Card 2/2

Name	:	TATARSKIY, V. I.
Dissertation	:	Microheterogeneities of a temperature field and fluctuation phenomena during the propagation of waves in the atmosphere
Degree	:	Cand Phys-Math Sci
Defended At	:	Inst Physics of the Atmosphere Acad Sci USSR
Publication Date, Place	:	1956, Moscow
Source	:	Knizhnaya Letopis' No 5, 1957





TATARSKIY, V. I.

"Amplitude and Phase Fluctuations in a Plane Wave Propagated in a Turbulent Medium with Slowly Varying Characteristics."

paper presented at the 4th All-Union Conf. on Acoustics, Moscow, 26 May - 4 Jun 58.

GURVICH, A. S., TATARSKIY, V. I. and TZVAND, L. R.

"Experimental Study of Twinkling of a Light Source Situated on the Earth's Surface."

paper presented at the 4th All-Union Conf. on Acoustics, Moscow, 26 May - 4 Jun 58.

TATARSKIY, V. I. (AS USSR, Moscow)

"Wave Scattering by Random Heterogeneities of the Refraction Index in the Fresnel Diffraction Approximation".

report presented at the All-Union Conference on Statistical Radio Physics, Gor'kiy, 13-18 October 1958. (Izv. vyssh uchev zaved-Radiotekh., vol. 2, No1 1, pp 121-227) COMPLETE card under SIFOROV, V. I.)

3(7) SOV/33-35-4-11/25

AUTHORS: Tatarskiy,V.I., Gurvich,A.S.,Kallistratova, M.A., Terent'yeva,L.V.

TITLE: The Influence of Meteorological Conditions on the Intensity of Light Scintillation Near the Surface of the Earth (O vliyanii meteorologicheskikh usloviy na intensivnost' mertsaniya sveta v prizemnom sloye atmosfery)

PERIODICAL: Astronomicheskiy zhurnal,1958, Vol 35, Nr 4, pp 623-626(USSR)

ABSTRACT: The authors report on the experimental investigation of the dependence of scintillation of a source on the earth on the meteorological conditions. The observations have been carried out in autumn 1956 by an astrophysical expedition of the Institute for Atmospheric Physics, Academy of Science USSR. It was stated that the intensity of scintillation and the vertical gradient of the mean temperature strongly correlate (correlation coefficient 0.92) which shows a good coincidence with the theoretical results of the authors. The investigations have a provisional character and are to be continued.

Card 1/2

The Influence of Meteorological Conditions on the Intensity of Light Scintillation Near the Surface of the Earth SOV/33-35-4-11/25

There are 1 figure, and 14 references, 6 of which are Soviet, 5 American, and 3 English.

ASSOCIATION: Institut fiziki atmosfery AN SSSR (Institute of Atmospherical Physics AS USSR)

SUBMITTED: May 25, 1957

Card 2/2

AUTHOR: Tatarskiy, V. I. SOV/20-120-2-17/65

TITLE: On the Propagation of Waves in a Locally Isotropic and Turbulent Medium With Gradually Changing Characteristics (O rasprostranenii voln v lokal'no izotropnoy turbulentnoy srede s plavno menyayushchimisya kharakteristikami)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 2, pp. 289 - 292 (USSR)

ABSTRACT: A number of factors must be taken into account in the computation of the fluctuations of the amplitude and of the phase of waves which are propagated in a real atmosphere (or in the ocean): The intensity of turbulence can be different in the different domains of the jet. (Thus, for example, the intensity of the turbulence of the atmosphere depends upon altitude). In domains which are large as compared with the dimensions of the turbulence region the structural functions $\left[f(\vec{r}_1) - f(\vec{r}_2)\right]^2 = D_f(\vec{r}_1, \vec{r}_2)$ are supposed to depend only upon $|\vec{r}_1 - \vec{r}_2|$. In the special case in question the structural function can be represented by a spectral

Card 1/2

On the Propagation of Waves in a Locally Isotropic and Turbulent Medium With Gradually Changing Characteristics

SOV/20-120-2-17/63

expansion. The fluctuations of the refraction index n_1 can be represented in the form of a stochastic Fourier (Fur'ye) -Stieltjes (Stil't'yes) integral. It is possible to represent the correlation function of the logarithm of the wave amplitude in the plane x=L by means of a two-dimensional Fourier (Fur'ye) transformation of the function $F_1(\kappa)$ (which is defined in this paper).

The author then investigates the case - which is of practical importance - in which the fluctuations of the refraction index are described by the "two-thirds" law. The contribution made by the inhomogeneities to the fluctuations of the amplitude is independent of the coordinates of these inhomogeneities, it increases, however, with their distance from the point of observation. The formulae deduced in this paper can be used for the purpose of explaining peculiarities of the scintillation (mertsanye) of the stars. The "flickering" (drozhanye) of the images of the stars in the isotopes is caused primarily by the lower layers of the atmosphere, but scintillation is mainly due to the upper layers. These conclusions well agree with astronomical observations.

Card 2/3

9 references, 7 Soviet

Inst. of Atmospheric Physics, AS USSR

24(4), 3(7) SOV/20-123-4-22/53

AUTHORS: Gurvich, A. S., Tatarskiy, V. I., Tsvang, L. R.

TITLE: Experimental Investigation of the Statistical Characteristics of the Scintillation of a Terrestrial Source of Light (Eksperimental'noye issledovaniye statisticheskikh kharakteristik mertsaniya nazemnogo istochnika sveta)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 4, pp 655-658 (USSR)

ABSTRACT: If the fluctuation of the refraction index n of a medium obeys the "2/3-law"

$$\overline{\left[n(\vec{r}+\vec{\varrho}) - n(\vec{r})\right]^2} = C_n^2 \varrho^{2/3}$$

and the conditions $\lambda \ll l_0$, $\lambda^3 L \ll l_0^4$, $l_0 \ll \sqrt{\lambda L} \ll L_0$, $C_n^2 L l_0^{-1/3} \ll 1$, the following conclusions may be drawn from the present theory. (C_n^2 denotes a constant quantity depending on grad $\bar{n}$ and on the characteristics of turbulence, l_0 and L_0 - the internal and external scales of turbulence respectively, λ - the wave length, L - the distance covered by the wave in the turbulent medium). 1) The intensity fluctuations of

Card 1/4 5

Experimental Investigation of the Statistical Characteristics of the Scintillation of a Terrestrial Source of Light

light are distributed according to a logarithmically normal law. 2) For the dispersion of the intensity I of the light wave the formula

$$\sigma^2 = \overline{\left[\ln I - \overline{\ln I}\right]^2} = 10.5\, C_n^2\, \lambda^{-7/6} L^{11/6}$$

applies, and herefrom it follows that $\sigma^2 \sim L^{11/6}$. 3) The correlation function B_I of the fluctuations of the intensity logarithm of light in the plane which is vertical to the beam depends on

$$\varrho/\sqrt{\lambda L}: \quad B_I = B_I\left(\frac{\varrho}{\sqrt{\lambda L}}\right).$$

Here ϱ denotes the distance between the points of obeervation and the correlation scale (masshtab korrelyatsii) is of the order $\sqrt{\lambda L}$. 4) A function is given for the fluctuation frequency spectrum. All these regularities were experimentally checked 1956-57 over a very flat area of the steppe in the Tsimlyansk district. Together with measurements of flickering, the mean temperature, the wind velocity in 0.5; 1; 2; 4; 8 and 12 m, and also the direction of the wind were measured.

SOV/20-123-4-22/53

Experimental Investigation of the Statistical Characteristics of the Scintillation of a Terrestrial Source of Light

Measuring results: Ad 1) About 100 empirical distribution functions were investigated. They all show satisfactory agreement with the hypothesis of the logarithmically normal distribution law of I. By using this law it is possible to express the quantity σ^2 by experimentally observed quantity. Ad 2) The simplest method of reducing observation data to equal meteorological conditions is that of averaging all values of σ^2 obtained in the case of given L and different meteorological conditions. The dependence of the quantity σ^2 on the distance L corresponds satisfactorily to the theoretical relation $\sigma^2 \sim L^{11/6}$. Ad 3) In the case of varying L, the values of the correlation coefficient R agree well with one another. The results obtained by the present paper confirm the similarity law $R=R(\varrho/\sqrt{\lambda L'})$. Ad 4) About 80 frequency spectra were evaluated at L = 1000 m and L = 2000 m. Also the results obtained by these investigations supplied additional confirmation of the similarity law. Summarizingly, it may be said that the data obtained in the present paper agree satisfactorily with the initially formulated main conclusions of the theory. There are 4 figures, 1 table, and 15 Soviet references.

Card 3/4 3

Inst of Atmospheric Physics, AS USSR

9(9) PHASE I BOOK EXPLOITATION SOV/3009

Tatarskiy, Valer'yan Il'ich

Teoriya fluktuatsionnykh yavleniy pri rasprostranenii voln v turbulentnoy atmosfere (Theory of Fluctuation Phenomena in Propagation of Waves in Turbulent Atmosphere) Moscow, Izd-vo AN SSSR, 1959. 230 p. Errata slip inserted. 2,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut fiziki atmosfery.

Ed.: A. M. Obukhov, Corresponding Member, U.S.S.R. Academy of Sciences; Ed. of Publishing House: V. V. Shmidt; Tech. Ed.: T. A. Prusakova.

PURPOSE: This book may be useful to scientists and engineers concerned with propagation and scattering of electromagnetic and sound waves.

COVERAGE: The author discusses the theory of scattering of electromagnetic and sound waves as well as the theory of fluctuation of parameters of short waves in a turbulent atmosphere. He presents some information from the theory of random fields and the theory of turbulence and discusses fluctuations of the amplitude and phase of radio waves in a turbulent

Card 1/3

atmosphere. He also presents experimental results of study of atmospheric turbulence as well as the results of study of sound and light propagation near the ground. The results of observation of stellar scintillation are also presented. The author thanks A. M. Obukhov and A. M. Yaglom for their help in writing the book. There are 99 references: 73 Soviet (including 4 translations), 25 English and 1 German.

TABLE OF CONTENTS:

Theory of Fluctuation (Cont.) SOV/3009

Card 3/3 AVAILABLE: Library of Congress

JP/lsb
12-10-59

24,3200 (1051, 1106 only)
6.3000 (1138, 2801 only)

89753
S/169/61/000/002/005/039
A005/A001

Translation from: Referativnyy zhurnal, Geofizika, 1961, No. 2, p. 21, # 2B159

AUTHOR: Tatarskiy, V. I.

TITLE: The Interpretation of Observations of the Scintillation of Stars and Removed Terrestrial Light Sources

PERIODICAL: Tr. Soveshchaniya po issled. mertsaniya zvezd, 1958. Moscow-Leningrad, AN SSSR, 1959, pp. 7-25. Discuss., pp. 60-62

TEXT: The main conclusions of the theory of light scintillation are briefly set forth. The formulae are presented for the mean square of the fluctuations of intensity and the incidence angle of light. It is pointed out that all inhomogeneities crossing the ray play the equal part in the phenomenon of "tremor" of the image regardless of their distance from the point of observation, whereas the inhomogeneities remote from the point of observation play the main part in the scintillation phenomenon. For the practically important case of $l_0 \ll \sqrt{\lambda H} \ll L_0$ (l_0 is the dimension of the minimum inhomogeneities, L_0 is the dimension of the maximum inhomogeneities, H is the thickness of the optically active layer of the atmosphere), the root-mean-square value of the fluctuations of intensity of the

Card 1/2

89753

S/169/61/000/002/005/039
A005/A001

The Interpretation of Observations of the Scintillation of Stars and Removed Terrestrial Light Sources

light wave is proportional to $(\sec\theta)^{11/12}$, and the root-mean-square value of the fluctuations of the incidence angle is proportional to $(\sec\theta)^{1/2}$, where θ is the zenith angle of the star. The correlation radius of the fluctuations of light intensity is equal to $\sqrt{\lambda H \sec\theta}$ in its order of magnitude. The fluctuations of the total light flux Φ passing through the objective are considered. It is noted that the dependence of the fluctuations Φ on sec θ is of the form $\sigma_\Phi \sim (\sec\theta)^{11/12}$ for an objective with the diameter $d < \sqrt{\lambda H}$, whereas it is $\sigma_\Phi \sim (\sec\theta)^{3/2}$ in case of $d \ll \sqrt{\lambda H \sec\theta}$. The decrease of the relative fluctuations Φ is computed at the expense of the averaging action of the objective, and from the comparison of these correlation with the experiment the value $\sqrt{\lambda H} \approx 7.6$ cm is determined. It is noted that the experimental observations of the correlation $\sigma_\Phi = f(\sec\theta)$ yield for different d this function in the form $\sigma_\Phi \sim (\sec\theta)^{\gamma}$, where γ varies from 0.9 to 1.5 for a variation of d from 2.5 to 30 cm, which agrees well with the theory. On the basis of the experimental values of the magnitudes of fluctuations of intensity and the incidence angle of light, the fluctuation magnitude of the refraction index of the troposphere is estimated. V. Tatarskiy

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

Card 2/2

84591

S/169/60/000/008/002/007
A005/A001

6.4780

Translation from: Referativnyy zhurnal, Geofizika, 1960, No. 8, p. 146, # 9506

AUTHORS: Bovsheverov, V. M., Gurvich, A. S., Tatarskiy, V. I., Tsvang, L. R.

TITLE: Devices for Statistically Analyzing the Turbulence

PERIODICAL: Tr. Soveshchaniya po issled. mertsaniya zvezd, 1958, Moscow-Leningrad, AN SSSR, 1959, pp. 26-33. Diskus., 60-62

TEXT: The determination of the statistic turbulence characteristics (moments of different order, correlation functions, and spectral functions) by means of electronic devices economizes considerably work and time and makes it possible to obtain the characteristics mentioned immediately from the measuring process. The choice of the working frequency band of the devices (from 0.01 to 1,000 cps) is determined by the spectral composition of the atmospheric turbulence and by the technical possibilities of accomplishing simple circuits with large time constants. The spectrum analyzer is designed according to the principle of parallel measurement and storage and fast successive interrogation. 30 semi-octave filters with feedback through a dual RC-bridge, and with resonance

Card 1/3

Devices for Statistically Analyzing the Turbulence

frequencies spaced also by semioctaves cover the band from 0.05 to 1,000 cps. The low-frequency filters have low sensitivity in consequence of their small absolute band width; the spectral density of turbulence pulsations rapidly diminishes at high frequencies. Therefore the amplification of the low and high frequencies is enhanced. The transmission of the wide frequency band below and above the resonance frequency, which is characteristic for the RC-filters used, is compensated by two RC-circuits (a differentiating and an integrating) at each filter input. Storage circuits consisting of a detector and a RC-circuit with the 100-sec time constant are at the filter outputs. The interrogation is performed by an interval selector connecting an output cathode follower successively to all storage circuits; the recording is carried out by the electronic potentiometer ЭПП-09 (EPP-09) and takes 30 - 50 sec. The distribution analyzer of the integration type operates according to the same principle of parallel storage and successive interrogation. It has 25 levels yielded by 25 discriminators, to the outputs of which storage circuits also are connected with the 100-sec time constant. The interrogation and recording are performed in the same manner as in the spectrum analyzer. A double pulse modulation circuit, by frequency and by amplitude, is used for the electric amplification of two voltages (measurement of the root-mean-square values and the correlation functions).

04771

S/169/60/000/008/002/007
A005/A001

Devices for Statistically Analyzing the Turbulence

The pulse duty factor is $\alpha = \tau/T$, where τ is the standard pulse duration, T is the repetition period: $1/T = f_0 + k_1 u_1$, where f_0 is the pulse frequency at the first signal voltage $u_1 = 0$, k_1 is the proportionality factor. The constant component after the modulation of the standard pulses by the voltage of the second signal u_2 is: $u = u_0 + k_2 u_2 \alpha = u_0 + k_2 \tau f_0 u_2 + k_1 k_2 \tau u_1 u_2$ (k_2 is the proportionality factor, u_0 is the constant shift). The two first terms are compensated automatically in a special substraction circuit; the output voltage is proportional to $u_1 u_2$ and is determined by the RC-circuit with RC = 100 sec. The devices were used for investigating the scintillation of light sources under surface conditions.

V. M. Bovsheverov

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

Card 3/3

89752

S/169/61/000/002/004/039
A005/A001

6.3000 (1138, 2801 only)

Translation from: Referativnyy zhurnal, Geofizika, 1961, No. 2, pp. 20-21, # 2B158

AUTHORS: Gurvich, A. S., Tatarskiy, V. I., Tsvang, L. R.

TITLE: The Scintillation of Terrestrial Light Sources

PERIODICAL: Tr. Soveshchaniya po issled. mertsaniya zvezd, 1958. Moscow-Leningrad, AN SSSR, 1959, pp. 33-46. Discuss., pp. 60-62

TEXT: Results are described of an experimental study of the fluctuations of the intensity of light J which propagates in the undermost layer of the atmosphere. Measurements of the functions of the distribution of fluctuation probabilities showed that the magnitude of J is distributed logarithmically normal. The experimental correlation

$$\sigma_J^2 = \overline{[\ln J - \overline{\ln J}]^2} = f(L),$$

where L is the distance between the light source and the observation point, agrees well with the theoretical correlation $\sigma_J^2 \sim L^{11/6}$. The measured radii of the correlation of fluctuations J proved to be equal to $1.6\sqrt{\lambda L}$ (for values of $\sqrt{\lambda L}$ from 1.6 to 3.2 cm), which well agrees with the theory with an accuracy up to a

Card 1/2

89752

S/169/61/000/002/004/039
A005/A001

The Scintillation of Terrestrial Light Sources

numerical factor. The experimental frequency spectra W(f) of the fluctuations J are well described by the expression $fw(f) = F\left(\frac{f\sqrt{\lambda L}}{v_\perp}\right)$, where $v_\perp$ is the component of the wind velocity perpendicular to the ray. The form of the function F is near the theoretical one, but differs from the latter by some details.

V. I. T.

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

Card 2/2

29487 S/035/61/000/009/011/036
A001/A101

3,8150

AUTHOR: Tatarskiy, V. I.

TITLE: Several remarks on the report of L. A. Chernov and M. N. Krom and on the speech of E. A. Blyakhman

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 9, 1961, 30, abstract 9A241 ("Tr. Soveshchaniya po issled. mertsaniya zvezd, 1958, Moscow-Leningrad, AN SSSR", 1959, 57-60)

TEXT: In a discussion following the report of L. A. Chernov and M. N.Krom and the speech of Blyakhman participated the following persons: V. I. Tatarskiy, M. N. Krom, A. M. Obukhov and O. A. Mel'nikov. The V. I. Tatarskiy remarks:

1) Fluctuations of the field complex amplitude

$$(\Delta p)^2 \text{ (where } p(x, y) = \frac{1}{i\lambda} \iint_{\Sigma} \frac{e^{ikR}}{R} e^{iS+L}\, dx'dy')$$

considered in the works of L. A. Chernov, M. N. Krom and E. A. Blyakhman are partially caused by an unobservable effect (have no immediate physical sense).

Card 1/2

3(1)

AUTHORS: Tatarskiy, V. I., Zhukova, L. N. SOV/20-124-3-20/67

TITLE: On the Chromatic Scintillation of Stars (O khromaticheskom mertsanii zvezd)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 3, pp 567-570 (USSR)

ABSTRACT: The present paper calculates chromatic scintillation on the basis of the wave equation and the representations of the theory of local isotropic turbulence. Because of the weak dispersion of the atmosphere, rays of different colors are also diffracted differently. The layers near the surface of the earth exercise no essential influence on the scintillation of stars, but the higher layers do. The thickness of the layer responsible for the scintillation of stars may be estimated as amounting to 10 to 15 km, in which case the upper part of the layer plays the main role. For calculating chromatic scintillation it is sufficient to calculate the coefficient of the correlation between the fluctuations of the amplitude in such an idealized case in which two plane monochromatic waves (with the wave lengths λ_1 and λ_2) propagate in one

Card 1/3

direction through the atmosphere without diffraction. The points of observation in the plane which is vertical to the rays have the distance $\rho(\Delta\lambda, \theta)$. Here θ denotes the zenith distance of the light wave. The whole investigation is based on the equation $\frac{\partial^2\psi}{\partial y^2} + \frac{\partial^2\psi}{\partial z^2} + 2ik\frac{\partial\psi}{\partial x} + 2k^2 n_1(x, y, z) = 0$, which describes the perturbations of the amplitude A and of the phase S of a monochromatic wave propagating along the x-axis. Here it holds that

$\mathrm{Re}\ \psi = \ln A - \overline{\ln A} \equiv \chi$, $\mathrm{Im}\ \psi = S - \bar{S} = S'$, $k = 2\pi/\lambda$; $n_1(x, y, z)$ denotes the fluctuations of the refraction index.

Conditions for the validity of equations are written down. The above-mentioned equation can be solved by spectral decompositions of the random fields $n_1(x, y, z)$ and $\psi(x, y, z)$. In this way the problem may be reduced also to an ordinary differential equation. The course of the computation is followed step by step. Next, the coefficient of the correlation $R(\Delta\lambda, \theta)$ between the fluctuations of the logarithm of the amplitude for the waves of the lengths λ_1 and λ_2 is determined. A

diagram shows the values of R $(\Delta\lambda, \theta)$ for different θ. The experimental data agree satisfactorily with the theoretical curves. By the chromatic scintillation it is possible to explain also the well-known fact that the intensity of scintillation (which is observed in integral light when telescopes of sufficiently small diameter (6-7 cm) are used), decreases with increasing zenith distance at $\theta > 60^\circ$. There are 2 figures and 10 references, 8 of which are Soviet.

ASSOCIATION: Institut fiziki atmosfery Akademii nauk SSSR (Institute for Atmosphere Physics of the Academy of Sciences, USSR)
Glavnaya astronomicheskaya observatoriya Akademii nauk SSSR (Main Astronomical Observatory of the Academy of Sciences, USSR)

PRESENTED: October 3, 1958, by V. G. Fesenkov, Academician

SUBMITTED: October 3, 1958

85976

S/141/60/003/004/001/019
E032/E314

9.9840

AUTHOR: Tatarskiy, V.I.

TITLE: Radiophysical Methods of Studying Atmospheric Turbulence (A Review)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol. 3, No. 4, pp. 551 - 583

TEXT: It is well known that atmospheric turbulence has an important effect on the propagation of radio waves in the atmosphere, giving rise to scattering and fluctuations in the phase, frequency and amplitude of radio waves. For this reason, a large number of papers concerned with this subject have appeared in the literature. Very valuable information about atmospheric turbulence can be obtained from the analysis of experiments on the propagation of radio waves in the atmosphere. Such an analysis is given in the present paper. The results obtained from this analysis are compared with the few direct determinations of turbulence in the troposphere and the lower ionosphere which have been published so far. The review is divided into the following sections.

Card 1/2

85976
S/141/60/003/004/001/019
E032/E314

Radiophysical Methods of Studying Atmospheric Turbulence (A Review)

1) Characteristics of atmospheric turbulence.
2) Scattering of radio waves in a turbulent atmosphere, and phase and amplitude fluctuations in the transmitted wave.
3) Experiments in the near-ground layer of the atmosphere.
4) Fluctuations in the refractive index of the troposphere.
5) Turbulence in the E-layer of the ionosphere.

There are 22 figures, 4 tables and 48 references: 25 Soviet, 1 Japanese (in English) and 22 English.

ASSOCIATION: Institut fiziki atmosfery AN SSSR (Institute of Physics of the Atmosphere of the AS USSR)

SUBMITTED: May 5, 1960

Card 2/2

GOLITSYN, G.S., GURVICH, A.S., TATARSKIY, V.I.

Frequency spectra of amplitude and phase difference fluctuations of sound waves in a turbulent atmosphere. Akust. zhur. 6 no.2:187-197 '60. (MIRA 13:8)

1. Institut fiziki atmosfery AN SSSR, Moskva.
(Sound waves) (Atmospheric acoustic)

86366
S/046/60/006/004/016/022
B019/B056

6,8000 (3201,1099,1162)

AUTHORS: Kallistratova, M. A., Tatarskiy, V. I.

TITLE: The Consideration of the Vorticity of the Wind Field in Calculating Sound Scattering in the Atmosphere

PERIODICAL: Akusticheskiy zhurnal, 1960, Vol. 6, No. 4, pp. 503 - 505

TEXT: Tatarskiy and other Russian scientists, in calculating the sound scattering by turbulent pulsations of the wind velocities and the temperature in the atmosphere proceeded from the differential equation

$$\Delta\varphi - \frac{1}{c^2}\frac{\partial^2\varphi}{\partial t^2} = \frac{2\vec{v}'}{c^2}\nabla\frac{\partial\varphi}{\partial t} \qquad (1)$$

and from the acoustic theory of non-uniformly moving media. Here φ is the potential of the acoustic velocity, c - the velocity of sound, and $\vec{v}'$ the pulsation rate of the wind. In the present paper reference is made to experimental results obtained at the Tsimlyanskaya nauchnaya stantsiya Instituta fiziki atmosfery AN SSSR (Tsimlyansk Scientific Station of the Institute of the Physics of the Atmosphere of the AS USSR), and it is

Card 1/2

86366

The Consideration of the Vorticity of the Wind Field in Calculating Sound Scattering in the Atmosphere

S/046/60/006/004/016/022
B019/B056

shown that the assumptions made by the scientists mentioned are not justified. Already the American Kraichnan (Ref. 4) solved the problem without using the sound potential and the essential restriction curl = 0. The authors show in this case that, especially in the case of large scattering angles, the vorticity of the wind field must not be neglected when investigating the scattering of sound waves. There are 1 figure and 5 references: 4 Soviet and 1 US.

ASSOCIATION: Institut fiziki atmosfery AN SSSR, Moskva (Institute of the Physics of the Atmosphere of the AS USSR, Moscow)

SUBMITTED: April 23, 1960

Card 2/2

S/042/61/016/004/003/005
C111/C444

AUTHOR: Tatarskiy, V. I.

TITLE: On the primitive functional and application of it to the integration of certain equations in functional derivatives

PERIODICAL: Uspekhi matematicheskikh nauk, v. 16, no. 4, 1961, 179-186

TEXT: As analogue of the indefinite integral of the ordinary analysis the "primitive functional" is defined, and by aid of it some of the most simple equations with functional derivatives are solved.

One considers functions $y(\xi)$ on the interval (a,b) and the functionals $\Phi[y(\xi)]$. The functional derivative is defined by

$$\frac{\delta\Phi[y(\xi)]}{\delta y(x)\,dx} = \lim_{\Delta x \to 0} \frac{\{\Phi[y(\xi) + \delta y(\xi)] - \Phi[y(\xi)]\}}{\int_{\Delta x} \delta y(\xi)\, d\xi} \qquad (1)$$

where $\delta y(\xi) \neq 0$ on $(x, x + \Delta x)$; the curved bracket means

Card 1/5

On the primitive functional and . . .

that the part which is linear in δy, is taken from $\Phi [y(\xi) + \delta y(\xi)] - \Phi[y(\xi)]$. The functional derivative $\frac{\delta \Phi [y(\xi)]}{\delta y(x)\, dx} - F[y(\xi);x]$ is a functional which generally depends on x as a parameter.

The author examines the problem: the determination of the functional $\Phi [y(\xi)]$ which has the functional derivative: $F[y(\xi);x]$ i. e. the problem

$$\frac{\delta \Phi [y(\xi)]}{\delta y(x) dx} = F[y(\xi);x] . \qquad (2)$$

$$\Phi[y_0(\xi)] = 0 \qquad (3)$$

has to be solved. The functional $\Phi[y(\xi)]$ is called "primitive functional".

Card 2/5

It is shown that in case of $F[y(\xi); x]$ continuous in $y(\xi)$ (continuous with respect to the metric of the space L_1), satisfying the condition of symmetry

$$\frac{\delta F[y(\xi); x_1]}{\delta y(x_2)\, dx_2} = \frac{\delta F[y(\xi); x_2]}{\delta y(x_1) dx_1} \qquad (5)$$

and being a continuous function of x, the solution of (2) - (3) is given uniquely by

$$\Phi[y(\xi)] = \int_a^b [y(x) - y_0(x)]\, F[\theta(x-\xi)y_0(\xi) + \theta(\xi - x)y(\xi); x]\, dx \qquad (13)$$

where θ is defined by

$$\theta(x) = \begin{cases} 0 \text{ for } x \leq 0 \\ 1 \text{ for } x > 0 \end{cases} \qquad (12)$$

But if the initial condition is $\Phi[y_0(\xi)]$, then

On the primitive functional and . . .

$$\Phi[y(\xi)] = \Phi[y_0(\xi)] + \int_a^b [y(x) - y_0(x)]\, F[\Theta(x-\xi)y_0(\xi)+\Theta(\xi-x)y(\xi);x]\, dx \qquad (14)$$

is the solution of (2).

The derivations of the equations (13) and (14) cannot be called very exact, as the author himself admits, since the suppositions under which (13) and (14) hold are not investigated any farther.

As an example for the application of (14) the integration of the following equation is considered

$$\frac{\delta\Phi[y(\xi)]}{\delta y(x)dx} + P[y(\xi);\, x]\,\Phi[y(\xi)] = Q[y(\xi);x]$$

the coefficients of which are continuous in $y(\xi)$ and x and satisfy certain conditions of symmetry.

Adjoining the author considers the equation

Card 4/5

$$\frac{\delta\phi[y(\xi)]}{\delta y(x)dx} = N[y(\xi), y'(\xi), \ldots, y^{(n)}(\xi); x], \qquad (22)$$

where N is a continuous functional with respect to all arguments. By introducing $v(\xi) = y^{(n)}(\xi)$, (22) is brought to the form

$$(-1)^n \left(\frac{d}{dx}\right)^n \frac{\delta\phi[v(\xi)]}{\delta v(x)\,dx} = f[v(\xi); x]. \qquad (25)$$

which can be reduced to (2) by an n-times integration with respect to x.

The integration of non-symmetrical functionals $F[y(\xi); x]$ which do not satisfy (5), and the solution of functional equations with higher derivatives is shortly discussed.

There are 2 Soviet-bloc references and 1 non-Soviet-bloc reference. The reference to English-language publication reads as follows: E.Hopf, Statistical hydromechanics and functional calculus, Journ. ration. mech. and analysis 1, no. 1(1952),87.

SUBMITTED: August 7, 1959

Card 5/5

43176
S/506/62/000/004/003/005
E032/E314

AUTHORS: Tatarskiy, V.I. and Golitsyn, G.S.

TITLE: On the scattering of electromagnetic waves by turbulent irregularities in the troposphere

SOURCE: Akademiya nauk SSSR. Institut fiziki atmosfery. Trudy. no. 4. 1962. Atmosfernaya turbulentnost'. 147-202

TEXT: The aim of this review paper is to give a general systematic account of the theory of scattering of radio waves in the troposphere. The review is based on 52 published references (29 of which are of Soviet origin) covering the period 1930-1959. Some of the problems have already been reviewed in a previous publication (V.I. Tatarskiy - Teoriya fluktuatsionnykh yavleniy pri rasprostranenii voln v turbulentnoy atmosfere (Theory of fluctuation phenomena during the propagation of waves in a turbulent atmosphere) - Izd-vo AN SSSR, 1959). These problems are considered in greater detail in the present paper with particular attention to the physical interpretation of the mechanism of scattering of radio waves by random phenomena. The subject matter is considered under the following headings: 1) basic equations

Card 1/2

S/506/62/000/004/003/005
E032/E314

On the scattering of ....

and their solution; 2) scattered field in the region of Fraunhofer diffraction; 3) qualitative discussion of the formula for the scattered field; 4) representation of the scattered field in terms of the spectrum of the refractive index; 5) the "statistical" formula of Bragg; 6) scattering by random irregularities on the Fresnel diffraction approximation; 7) microstructure of permittivity fluctuations in a turbulent atmosphere; 8) calculation of the average scattering power along real propagation paths; 9) correlation functions for the scattered field; 10) statistical properties of the scattered field and 11) scattering of a pulse. Sections 6, 8, 9 and 11 are said to include a proportion of new material not previously published. There are 15 figures.

Card 2/2

40023
S/141/62/005/003/004/011
E032/E514

9,9800

AUTHOR: Tatarskiy, V.I.

TITLE: Second approximation to the problem of the propagation of waves in a random medium

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, v.5, no.3, 1962, 490-507

TEXT: This paper is concerned with second approximation corrections to the average amplitudes and phases of waves and the fluctuation spectra and correlation functions in the continuous perturbation method put forward by S. M. Rytov (Ref.1: Izv.AN SSSR, ser.fiz., 2, 223, 1937). The analysis is confined to the scalar case and it is assumed that the time dependence of the fields is simple harmonic. The analysis is then used to estimate the limits of applicability of Rytov's method. It is shown that the second order approximations to the different wave parameters become significant at different distances from the source of radiation. Corrections to the mean phases and amplitudes and RMS amplitude fluctuations are negligible if the RMS amplitude fluctuation calculated on the first approximation is small, whatever the phase

Card 1/2

difference fluctuation, which may not be small. The correction to the RMS phase-difference fluctuation calculated on the first approximation D_{s1} is small provided $D_{s1} \ll \pi$, independently of the magnitude of fluctuations in the amplitude and the average phase gain, which may not be small. In the case of measurements of fluctuations in the angle of arrival, this is equivalent to the condition that fluctuations in the angle of arrival should be small in comparison with the antenna beam-width. The first approximation of the method of continuous perturbations is satisfactory for radiowave fluctuations in the troposphere but must be improved in the case of fluctuations in light-phases.

ASSOCIATION: Institut fiziki atmosfery AN SSSR
(Institute of Physics of the Atmosphere AS USSR)

SUBMITTED: October 16, 1961

43398

S/141/62/005/005/004/016
E032/E514

AUTHOR: Tatarskiy, V.I.

TITLE: On the theory of refraction in a layered medium

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, v.5, no.5, 1962, 923-928

TEXT: In a plane-layered medium the equations defining a ray are $n(z)\sin\varphi = \sin\varphi_0$, $\operatorname{cotan}\varphi = dz/dx$, where n is the refractive index and the remaining symbols are indicated in Fig.1. It is assumed that n = 1 at the point of observation. Integration then yields

$$\tan\alpha = \sin(\alpha - \psi)\,\frac{1}{h}\int_0^h \frac{dz}{\sqrt{n^2(z)-\sin^2(\alpha-\psi)}} \qquad (1)$$

For given n(z), h and α, Eq.(1) represents an equation from which the refraction angle ψ can be determined. The latter quantity may be found from Eq.(1) by expanding the right-hand side into a double series in powers of ψ and $1 - n^2(z) = 2aN(z)$ and retaining only the first terms of the two expansions. In the present paper ψ is obtained in the form a series in N only. It is shown that ψ is in fact given by

Card 1/3

$$\psi = \tan\alpha\, a\bar{N} - \tan\alpha(1 + 2\tan^2\alpha)(a\bar{N})^2 + \frac{3}{2}\tan\alpha(1 + \tan^2\alpha)a^2(\overline{N^2}) +$$

$$+ \frac{5}{2}\tan\alpha(1 + \tan^2\alpha)^2 a^3(\overline{N^3}) - 3\tan\alpha(1 + 4\tan^2\alpha + 3\tan^4\alpha)a\bar{N}a^2(\overline{N^2}) + \quad (15)$$

$$+ \frac{1}{3}\tan\alpha(3 + 20\tan^2\alpha + 21\tan^4\alpha)(a\bar{N})^3 + \ldots$$

where $$\bar{N} = \frac{1}{h}\int_0^h N(z)dz, \quad (\overline{N^2}) = \frac{1}{h}\int_0^h N^2(z)dz, \quad (\overline{N^3}) = \frac{1}{h}\int_0^h N^3(z)dz \quad (14)$$

This series applies to a plane-layered medium but it can be extended to the case of a spherically-layered medium also, and the corresponding expression is reproduced. This general analysis is then applied to a medium where the concentration N(z) is a linear function of z. Since in this case an exact solution can be obtained by integration, the result obtained from the series and from the exact solution can be compared. It is in fact found that calculation based on Eq.(15), or its analog for the spherical

case, yield more accurate results than the simple formula in which only terms linear in N are retained.

ASSOCIATION: Institut fiziki atmosfery AN SSSR
(Institute of Physics of the Atmosphere AS USSR)

SUBMITTED: March 2, 1962

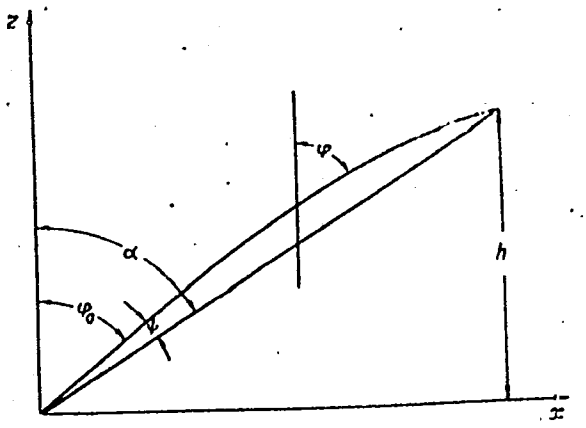


Fig.1

Card 3/3

24.4400

37887
S/056/62/042/005/038/050
B108/B138

AUTHOR: Tatarskiy, V. I.

TITLE: Application of quantum-field theory methods to the problem of the decay of homogeneous turbulence

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 5, 1962, 1386-1396

TEXT: Starting from the Navier-Stokes equation for an incompressible viscous liquid, the author describes homogeneous turbulence and its decay with methods similar to quantum-field theory. The Hopf equation for the characteristic functional is the analog of the Schrödinger equation for a nonlinear Bose vector field with strong interaction. It is shown that it is possible to solve the problem in question with the mathematical methods of field theory. This includes ordering of the S matrix according to Hori with the solution in the form of a continuous integral. The core of this integral, which may be termed the Green functional for the Hopf equation, can be written in finite form. The exact solution is too complex for any concrete conclusions to be drawn directly from it.

Card 1/2

Application of quantum-field theory ...

However, analysis of the solution shows that at infinitely great Reynolds numbers in the initial state, the law for the decay of turbulence is independent of the form of the probability distribution of that state. The two most important English-language references are: E. Hopf. J. Ration. Mech. and Analysis, 1, 87, 1952; S. Hori. Progr. Theor. Phys., 7, 578, 1952.

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

SUBMITTED: January 3, 1962

Card 2/2