GORIN, A.P., prof. doktor sel'skokhoz. nauk; MOLCHAN, I.M., aspirant

Sexual differences in generative organs and the reaction of a plant to self-pollination. Izv. TSKHA no.6:102-116 '64
(MIRA 18:1)

1. Kafedra genetiki i selektsii rasteniy Moskovskoy ordena Lenina sel'skokhozyaystvennoy akademii imeni K.A.Timiryazeva.

MOROZOV, A.A. [Marozau, A.A.], prof.; MOLCHAN, Ye.P. [Molchan, E.P.]; MEYERSON, S.I. [Meerson, S.I.]

On the 60th birthday and 35th anniversary of the research and pedagogic and public activities of Sergei Mikhailovich Lipatov. Vestsi AN BSSR.Ser.fiz.-tekh.nav. no.4:131-133 '59. (MIRA 13:4)
(Lipatov, Sergei Mikhailovich, 1899-)

MOLCHANOV, Ivan Il'ich; NEFEDOV, Viktor Grigor'yevich; MIKHNEVICH, A.Ye., red.; TSYURKO, M.I., tekhn. red.

[Intercollective farm cooperatives in Orenburg Province] Mezhkolkhoznye ob"edineniia v Orenburgskoi oblasti. Orenburg, Orenburskoe knizhnoe izd-vo, 1960. 29 p. (MIRA 14:10)
(Orenburg Province--Collective farms--Interfarm cooperation)

MOLCHANKIN, Yu.T.

SOV/19-58-6-554/685

AUTHORS: Burtsev, V.K., Velyutin, S.P., Zarayev, I.I., Lysenko, K.Ye., Migdal, Ye.Ye., Molchankin, Yu.T., Nyaina, A.S., Nyagkov, M.A., Pavlov, V.N., and Filippovich, V.N.

TITLE: A Method of Coloring the Ends of Paper Cartridges on Cobbin-Binding Machines (Sposob okraski kontsov bumazhnykh patronov na shpulezavertochnykh mashinakh)

PERIODICAL: Byulleten'izobreteniy, 1958, Nr 6, p 122 (USSR)

ABSTRACT: Class 54c, 4. Nr 115596 (560171 of 11 Oct 57). Submitted to the Committee for Inventions and Discoveries at the Ministers Council of USSR. In order to simultaneously color both ends of the cartridge by one coloring roller, the paint is applied on oneside of the paper tape in the form of rectangular sections; the tape is cut down the center of the colored sections and fed to the rotating spindle with the side opposite to the colored sections facing outwards.

Card 1/1

MOLCHANOV, A., prof.

Strengthen creative relations between science and practice.
Fin. SSSR 37 no.11:87-88 N'63. (MIRA 17:2)

1. Prorektor po nauchnoy rabote Leningradskogo finansovo-ekonomicheskogo instituta.

MOLCHANOV, A., komandir letnogo podrazdeleniya

...and service is service. Grazhd. av. 22 no.6:14-15 Je '65.
(MIRA 18:6)

MOLCHANOV, A. A.

Mbr., Forestry Institute, Acad. Sci. (-1947-)

"Water System of Sandy Soil in the Forest and in the Field," Dok. AN, 58, No. 9, 1947 (2049-2052)

"Rapidity of Disintegration of the Fallen Pine and Spruce Needles," Dok. AN, 56, No. 8, 1947

MOLCHANOV, A. A.

"Consumption of Moisture by the Drawing Off of the Root Systems of Pine in Stands of Different Age and Size," ~~Ibid.~~, Dokl. AN SSSR 60, No. 8, 1948. Inst. Forestry: Acad. Sci., c1948-.

MOLCHANOV, A. A.

"Water Consumption by Evaporation and Transpiration by the Moss and Grass Cover in the Forest and in the Open," ~~ibid.~~ Dokl AN SSSR, 61, No. 4, 1948; Forestry Inst. Acad. Sci. c1948-.

MOLCHANOV, A. A.

"Humus Balance in the Soils of the Red Bilberry,

Whortle Berry Patches and Pine Forests and Fields,"

DAN

~~Ibid.~~, 62, No.5, 1948. Forestry Inst., Acad. of Sci.

c1948-.

MOLCHANOV, A. A.

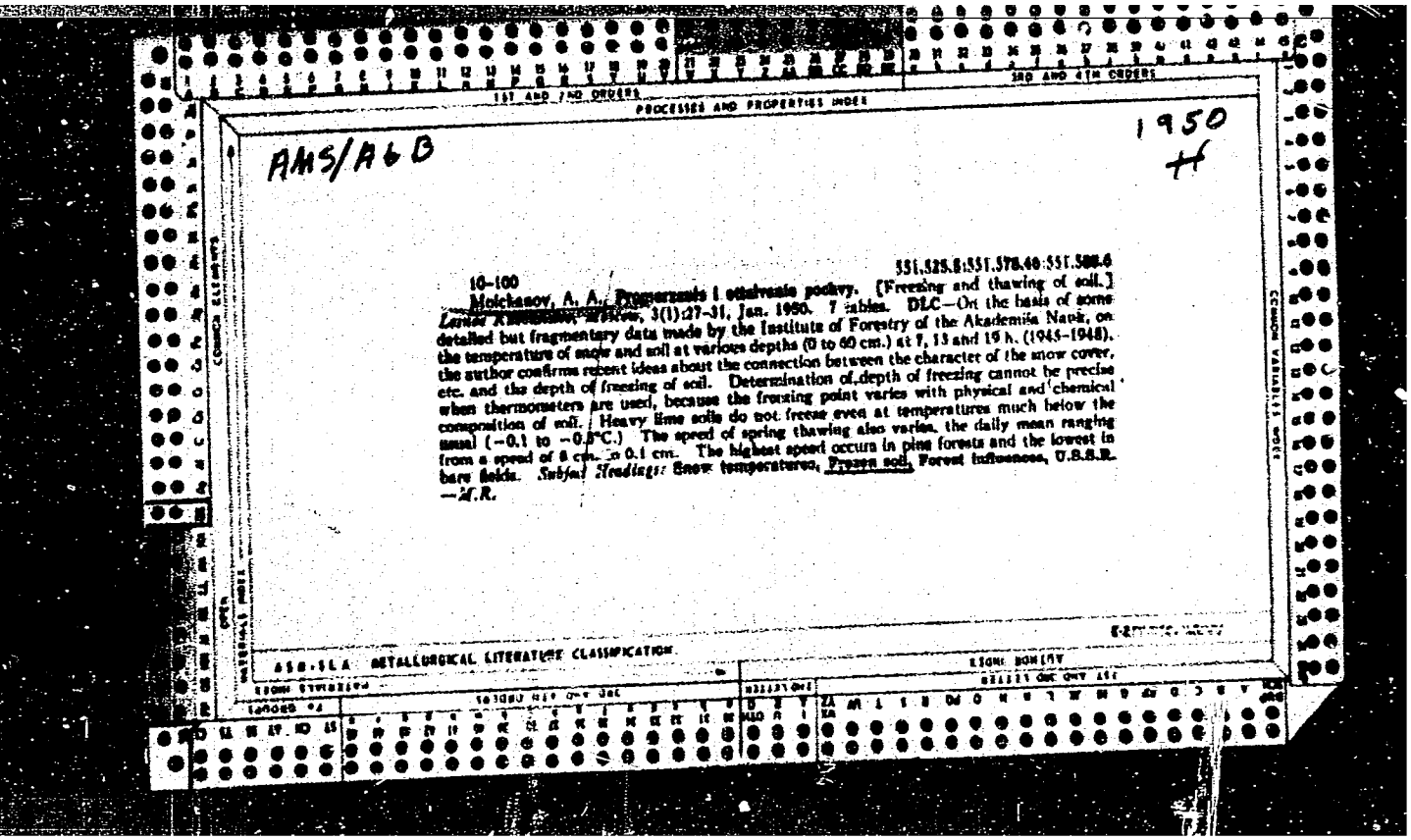
"Hydrological Significance of Forest," Byul. Mosk. Obshch. Ispytat. Prirody, Otdel Biol., 54, No. 4, 1949.

MOLCHANOV, A. A.

Prediction of the Harvest of Seeds of the Fir Tree, Dokl. AN SSSR, 64, No. 5, pp 719-22, 1949.

MOLCHANOV, A. A.

"Coniferous Needle Resources of Pine Forests of a Different Age," ~~Ibid.~~ Dokl AN SSSR, 67, No. 5, 1949. Inst. Forestry, Acad. Sci., c1949-.



551.525.8:551.578.46:551.508.6

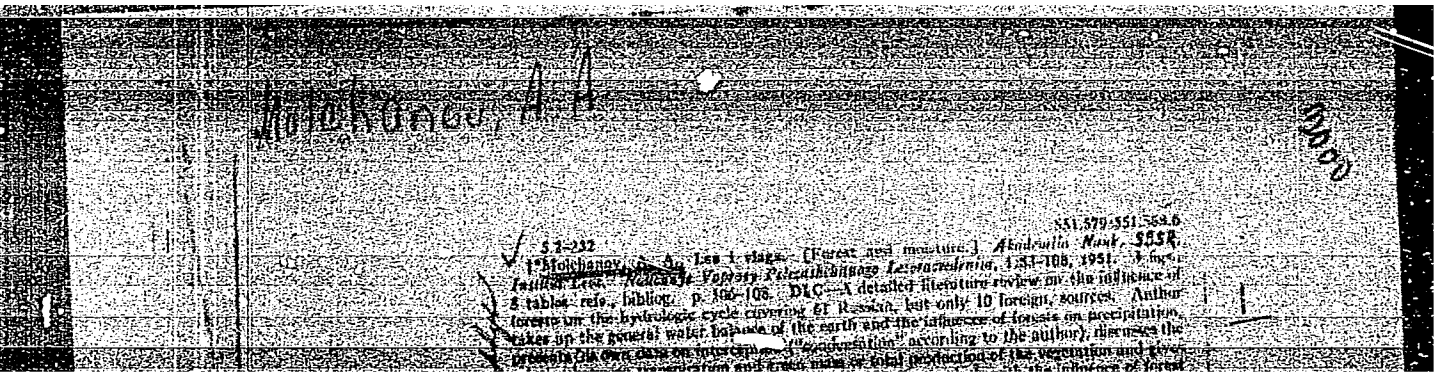
10-100
Moiseenov, A. A. Promerzanie i otaivanie pochvy. [Freezing and thawing of soil.] *Lesnoe Khozyaistvo*, Moskva, 3(1):27-31, Jan. 1950. 7 tables. DLC—On the basis of some detailed but fragmentary data made by the Institute of Forestry of the Akademiia Nauk, on the temperature of snow and soil at various depths (0 to 60 cm.) at 7, 13 and 19 h. (1945-1948), the author confirms recent ideas about the connection between the character of the snow cover, etc. and the depth of freezing of soil. Determination of depth of freezing cannot be precise when thermometers are used, because the freezing point varies with physical and chemical composition of soil. Heavy lime soils do not freeze even at temperatures much below the usual (−0.1 to −0.5°C.) The speed of spring thawing also varies, the daily mean ranging from a speed of 8 cm. to 0.1 cm. The highest speed occurs in pine forests and the lowest in bare fields. *Subject Headings:* Snow temperatures, Frozen soil, Forest influences, U.S.S.R. —*M.R.*

MOLCHANOV, A. A.

"The Hydrological Role of Pine Forests on Sandy Soils." Sub 7 May 51, Inst of Forestry, Acad Sci USSR.

Dissertations presented for science and engineering degrees in Moscow during 1951.

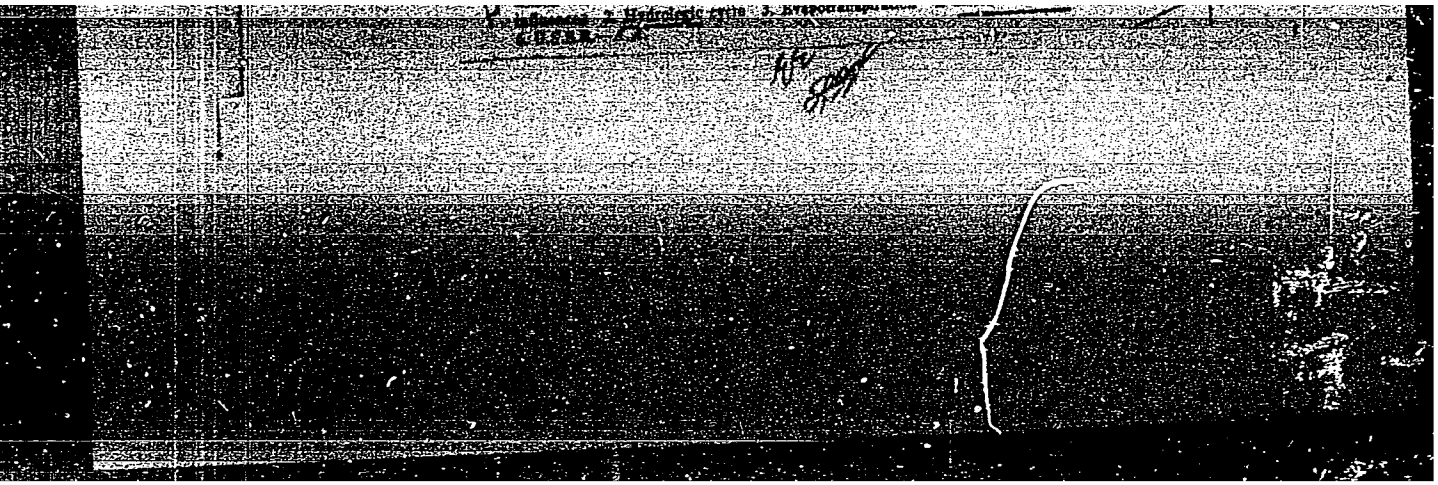
SO: Sum. No. 480, 9 May 55



551.579:551.588.6

5.2-232

Stolchanov, A. A. Les i vlaga. [Forest and moisture.] *Akademiia Nauk, SSSR, Leningradskoe Otdelenie Institut Lesa. Nauchnye Zapiski Leningradskogo Lesotekhnicheskogo Instituta*, 1:31-108, 1951. 3 figs., 8 tables, refs., bibliog. p. 106-108. DLC—A detailed literature review on the influence of forests on the hydrologic cycle covering 67 Russian, but only 10 foreign, sources. Author takes up the general water balance of the earth and the influence of forests on precipitation, "transformation" according to the author), discusses the



MOLCHANOV, A A

Gidrologicheskiya Rol' Sosnovykh Lesov Na Neschanykh Pochvakh (Hydrologic Role of Pine Forest on Sandy Soil) Moskva, Izd-vo Akademii Nauk SSSR, 1952.
486 p. Illus., Diagrs., Tables.
"Literatura": p. 468-(485)
At Head of Title: Akademiya Nauk SSSR. Institut Lesa.

N/5
729.41
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MOLCHANOV, A. A.

Sosnovyy Les i Vlaga [Pine forests and Humidity] Moskva Izd-Vo Akademiya Nauk SSSR, 1953. 138 p. "Literatura": p. 134- [137]
At head of title: Akademiya Nauk SSSR. Institut Lesa.

RODE, A.A.

~~RODE, A.A., professor.~~

A useful work on forest hydrology ("The hydrological role of pine forests on sandy soils." A.A.Molchanov. Reviewed by A.A.Rode). Priroda 41 no.7: 118-120 Jl '53. (MLRA 6:6)

(Molchanov, A.A.) (Forest influences)

MOLCHANOV, A. A.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No 22-40, 20 Feb - 3 Apr 1954)

Name	Title of Work	Nominated by
Molchanov, A. A.	"The Hydrological Role of Pine Trees in Sandy Soils"	Institute of Forestry, Academy of Sciences USSR

SO: W-30604, 7 July 1954

MOLCHANOV, A. A., jt. au.

Selective cuttings in forests in the North. Moskva, Izd-vo Akad. nauk SSSR, 1954. 146,(2) p. (55-44352)

SD499.R9A4

MOLCHANOV, A. A.

Molchanov, A. Forests as water-supply protectors. Tr. from the Russian. p.352.

Vol. 11, no. 8, Oct. 1955 GORSKO STOPANSTVO Sofiya, Bulgaria

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 2 February, 1956

MOLCHANOV, A. A.

Meteorologic factors and growth of forest vegetation in the oak-wood steppe. Tr. from the Russian. p.435.
GORSKO STOPANSTVO, Sofiya, Vol. 11, no. 10, Dec. 1955

SO: Monthly List of East European Accessions, (EEAK), LC, Vol. 5, No. 6 June 1956, Uncl.

MOLCHANOV, A.A.

ZONN, Sergey Vladimirovich; MOLCHANOV, A.A., prof., doktor biol.nauk, otvetstvennyy red.; BIRINA, A.V., red.izd-va; POLYAKOVA, T.V., tekhn.red.

[Forest soils of Bulgaria] Lesnye pochvy Bolgarii. Moskva, Izd-vo Akad.nauk SSSR, 1957. 86 p. (MIRA 11:2)
(Bolgaria--Forest soils)

MOICHANOV, Alek[illegible]; PREOBRAZHENSKIY, Ivan Fedorovich; MOTOVILOV, G.P., doktor sel'skokhozyaystvennykh nauk, otvetstvennyy redaktor; GRACHEV, A.P., redaktor izdatel'stva; PAVLOVSKIY, A.A., tekhnicheskiy redaktor

[Forests and forestry in Arkhangel'sk Province] Lesa i lesnoe khoziaistvo Arkhangel'skoi oblasti. Moskva, Izd-vo Akad.nauk SSSR, 1957. 237 p. (MLRA 10:10)
(Arkhangel'sk Province--Forests and forestry)

Molchanov, A.A

K-1

BULGARIA/Forestry - General Problems.

Abs Jour : Ref Zhur - Biol., No 3, 1958, 10555

Author : Molchanov, A.A.
Inst : -
Title : The Water Conservation Significance of Forests.

Orig Pub : Izv. In-ta za gorata, B"lg. Akad Nauk, 1957, 2, 3-48

Abstract : No abstract.

Card 1/1

Molchanov, A.A.

USSR / Forestry. General Problems. K-1

Abs Jour: Ref Zhur - Biologiya, No. 1, 1958, 1304

Author : Molchanov, A.A.

Inst : Institute of Forests of the Acad Sci USSR

Title : Forestry in India

Orig Pub: Soobshch. In-ta lesa. Akad. Nauk SSSR, 1957, No. 7, 40-65

Abstract: The forests of India are divided into the following fundamental groups, depending upon the ecological conditions: tropical -- wet and dry, mountainous -- subtropical and temperate zone, Alpine. There are more than 3000 varieties of trees. Restoration of some of the more valuable varieties (Shorea robusta, Tectonia grandis, Cedrus deodara, Pinus roxburgii, Terminalia, Dal-

Card 1/2

USSR / Forestry. General Problems

Abs Jour: Ref Zhur - Biologiya, No. 1, 1958, 1304

K-1

bergia sissoo, Dipterocarpus sp., Acacia sp., Santalum album, Bombax malabaricum.) is difficult. The forestry characteristics of the basic varieties are given, the thickness of planting and timber supply being indicated. The process of natural reforestation, the lumbering methods (maintenance and other principle ones), and methods of artificial reforestation are discussed. The basic appraisal indices for the most characteristic tree varieties are given.

Card 2/2

COUNTRY : USSR
CATEGORY : Forestry. General. K

ABS. JOUR. : RZhBiol., No. 14 1959, No. 63161

AUTHOR : Molchanov, A. A.
INST. : Forest Institute of the Acad. of Sciences of the USSR
TITLE : Water-conserving Protective Value of the Forest

ORIG. PUB. : Soobshch. In-ta lesa AN SSSR, 1957, vyp. 7, 91-149

ABSTRACT : The results are presented of investigations carried out in the USSR on the surface run-off on loamy and sandy soils. It is observed that the forest alters the flow of water, lowering to 20-25% the surface water and increasing to 54% the soil water; moreover, the water conduction of the rivers during the summer period grows. A 1% increase in afforestation lowers the run-off coefficient in the forest zone by 0.004-0.006, in the steppes by 0.008-0.010. When forests are correctly distributed on the watershed with forest plantations situated along the contours, it is possible to almost completely transform surface flow into soil water even

CARD: 1/3

COUNTRY :
CATEGORY : K

ABS. JOUR. : RZhBiol., No. 14 1958, No. 63161

AUTHOR :
INST. :
TITLE :

ORIG. PUB. :

ABSTRACT : when the percentage of afforestation is quite small. According to many years of observations, under steppe conditions the surface run-off is about 0.70; with afforestation of the upper, middle and lower parts of the slope in the amount of 6% of the total watershed area, the run-off drops to 0.30; and with an 18% afforestation, to 0.08. In mountains of the Caucasus under a beech-hornbeam canopy with a canopy closure of 0.7, surface run-off is almost absent. A lowering of the stocking density to less than 0.5 is undesirable. A short review is made of the results of studying surface run-off inside and outside of the forest from abroad. The protective role of the forest is examined

Card: 2/3

CARD: 3/3

COUNTRY : USSR
CATEGORY : Forestry. Forest Management. K

ABS. JOUR. : RZhBiol., No. 23 1958, No. 104522

AUTHOR [redacted]olchanov, A. A.
INST. : Forest Institute, Academy of Sciences, USSR
TITLE : Experience of Forest Management in the German Democratic Republic

ORIG. PUB. : Sooobshch. In-ta lesa, AN SSSR, 1957, vyp. 6, 64-80

ABSTRACT : Data are presented on the volume of forest utilization and on past forest management in GDR; the scientific bases of contemporary forest management are also characterized, as are silvicultural measures for the growing and forming of pure and mixed plantations; mentioned is the wide extent of clear and selective cuttings designed for the formation of large-sized stands which correspond to the site conditions. An artificial stand of Douglas-fir on thick sands with clay flooring, and larch stands, are described. Examples are presented of the formation of pure pine stands from the natural undergrowth by creating an uneven closure of crowns in one

Card: 1/2

USSR / Forestry. General Problems. K

Abs Jour : Ref Zhur - Biologiya, No 22, 1958, No. 100131

Author : Molchanov, A. A.
Inst : Forestry Institute, AS USSR
Title : A Program of Joint Research on the Problem of: "Scientific Bases of Economic Management in the Water-Retaining Oak Forests of the Forest-and-Steppe Zone".

Orig Pub : Tr. In-ta lesa AN SSSR, 1957, 33, 3-15

Abstract : Research under the program was conducted in the Tellerman Experimental Forest Area on forests of various types. The program's basic value is that it can be used for analogous investigations in other mountain deep leafy woods of the forest-and-steppe zone. It includes soil, microbiologic, and eco-phytocenotic research, research on photosynthesis and root-nutrition of plants, investigation of their water regime, hydrological and micro-

Card 1/2

USSR / Forestry. General Problems. K

Abs Jour : Ref Zhur - Biologiya, No 22, 1958, No. 100131

climatic investigations, the study of soil freezing, thawing, and surface evaporation, zoological investigations, and research into the phytopathological condition of the growing stock of trees. A short description is given of the content of each topic. -- V. V. Protopopov

Card 2/2

MOLCHANOV, A.A.

Applying biological methods for regulating water conditions in areas undergoing swamp formation. Trudy Inst. lesa 49:45-53 '59.
(MIRA 13:2)

1. Institut lesa AN SSSR.
(Swamps) (Forests and forestry)

MOLCHANOV, Aleksandr Alekseyevich

"Water Protecting and Water Regulating Role of Forests."

report to be submitted for the Fifth World Forestry Congress, Seattle, Washington, 29-10 Sep 60

Prof., Forestry Laboratory, Acad. of Sciences USSR, Moscow.

MOLCHANOV, Aleksandr Alekseyevich; SUKACHEV, V.N., akademik, otv.red.; KAVUN, P.K., red.izd-va; BRUZGUL', V.V., tekhn.red.

[Hydrological role of forests] Gidrologicheskaia rol' lesa. Moskva, Izd-vo Akad.nauk SSSR, 1960. 484 p. (MIRA 14:3)

(Forest influences)

MOLCHANOV, Aleksandr Alekseyevich; SUKACHEV, V.N., akademik, otv. red.; MARKOV, V.Ya., red. izd-va; SHEVCHENKO, T.N., tekhn. red.

[Forest and climate] Les i klimat. Moskva, Izd-vo Akad. nauk SSSR, 1961. 277 p. (MIRA 14:8)
(Forest influences) (Climatology)

MOLCHANOV, Aleksandr Alekseyevich; SUKACHEV, V.N., akademik, otv. red.; PAVLOV, A.N., red. izd-va; RYLINA, Yu.V., tekhn. red.

[Hydrological role of shelterbelts and methods for studying it] Gidrologicheskaia rol' polezashchitnykh polos i metodika ee izucheniia. Moskva, Izd-vo Akad. nauk SSSR, 1962. 186 p. (MIRA 15:7)

(Forest influences)

ALEKSAKHIN, Rudol'f Mikhaylovich; MOLCHANOV, A.A., prof., doktor biol. nauk, otv. red.; PASHKOVSKIY, Yu.A., red.izd-va; MAKOGONOVA, I.A., tekhn. red.

[Radioaktivnoe zagriaznenie pochvy i rastenii. Moskva, Izd-vo AN SSSR, 1963. 130 p. (MIRA 16:11)
(Soils, Radioactive substances in)
(Plants, Effect of radiation on)

MOLCHANOV, A.A.

Present state of forest hydrology in the U.S.S.R. and abroad.
Vop. geog. no.60:11-38 '63. (MIRA 16:6)

(Forest influences)
(Hydrology—Research)

MOLCHANOV, A.A.

Total evaporation and transpiration in a forest and in treeless areas. Vop. geog. no.60:55-76 '63. (MIRA 16:6)

(Evaporation) (Forest influences)

SUDNITSYN, Ivan Ivanovich; MOLCHANOV, A.A., prof., otv. red.; FROLOVA, A.A., red.izd-va; ANTSELOVICH, M.Ye., red. izd-va; GUS'KOVA, O.M., tekhn. red.

[Regularities in the movement of soil moisture; studying moisture movement by the method of thermodynamic translocation potential] Zakonomernosti peredvizheniia pochvennoi vlagi; issledovaniia peredvizheniia vlagi metodom termodinamicheskogo potentsiala perenosa. Moskva, Izd-vo "Nauka," 1964. 133 p. (MIRA 17:3)

SMIRNOV, Valeriy Vasil'yevich; MOLCHANOV, A.A., prof., otv. red.

[Seasonal growth of the major tree species] Sezonnyi rost glavneishikh drevesnykh porod. Moskva, Nauka, 1964. 165 p. (MIRA 17:9)

SUKACHEV, V.N., akademik; MOLCHANOV, A.A.; DYLIS, N.V., doktor biol. nauk; TSEL'NIKER, Yu.L.; KARPOV, V.G.; RAFES, P.M.; DINESMAN, L.G.; PEREL', T.S.; YEGOROVA, S.A.; YENIKEYEVA, M.G.; BOL'SHAKOVA, V.S.; ZONN, S.V.; ALEKSANDROVA, V.D.; LEBEDEV, D.V., red.

[Fundamentals of forest biogeocenology] Osnovy lesnoi biogeotsenologii. Moskva, Nauka, 1964. 573 p. (MIRA 18:2)

1. Akademiya nauk SSSR. Laboratoriya lesovedeniya.

GUSEV, Nikolay Nikolayevich; KITAYEV, Ivan Georgiyevich; YURRE, Nil Andreyevich[deceased]; MOLCHANOV, A.A., retsenzent; TIMOFEYEV, V.P., retsenzent; DUBININ, P.S., red.

[Forestry] Lesovodstvo. Moskva, Lesnaia promyshlennost', 1965. 246 p. (MIRA 18:12)

MOLCHANOV, A.A.

AVETISYAN, Khosrov Kurginovich [deceased]; TSEYDLER, A.A., professor, doktor, retsenzent; BURDUKOV, P.V., inzhener, retsenzent; MOLCHANOV, A.A., inzhener, retsenzent; RUKAVISHNIKOV, B.S., redaktor; ARKHANGEL'SKAYA, M.S., redaktor; ATTOPOVICH, M.K., tekhnicheskiy redaktor.

[Metallurgy of blister copper] Metallurgiia chernovoi medi. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1954. 464 p. (MLRA 7:12)
(Copper--Metallurgy)

MOLCHANOV, A.A.; YUKHTANOV, D.M.

Efficient utilization of copper and copper-zinc pyritic ores.
TSvet. met. 33 no.6:21-25 Je '60. (MIRA 14:4)
(Copper ores) (Zinc ores)

MOLCHANOV, A.A.

The complete utilization of raw materials in nonferrous metallurgy is the basis for a rapid increase in the production of mineral fertilizers. TSvet. met. 36 no.10:1-5 O '63. (MIRA 16:12)

MOLCHANOV, A.A.

Technological progress in the copper industry. TSvet. met. 38 no. 12:18-22 D '65 (MIRA 19:1)

MOLCHANOV, A.A. (Novosibirsk); SIGORSKIY, V.P. (Novosibirsk); FOMEL', B.M. (Novosibirsk)

Study of the dynamics of multistable elements based on a simplified model. Izv. AN SSSR. Tekh. kib. no.5:156-162 S-O '65. (MIRA 18:11)

L 5092-66 EWT(1)/T/EWA(h) IJP(c) AT

ACCESSION NR: AP5020125 UR/0109/65/010/008/1472/1479

681.142.642.7

AUTHOR: Molchanov, A. A. 44,55

TITLE: Transients in a nonlinear circuit containing a p-n-junction capacitance

SOURCE: Radiotekhnika i elektronika, v. 10, no. 8, 1965, 1472-1479

TOPIC TAGS: pn junction, transient process

ABSTRACT: Transient processes in a nonlinear circuit containing the capacitance of a p-n junction and operating as a trigger are considered. It is found that: (1) When a circuit applying heteropolar pulses to a supply circuit is controlled, its operating time and, therefore, its flip-flop time largely depends on the time constant of the detector load; (2) When the controlling signals are applied directly to the detector circuit, the operating time may depend on the inertia (Q-factor) of the nonlinear circuit; lowering the Q-factor for the time, during which the pulse is applied, permits increasing the speed of operation by several dozen times;

Card 1/2

L 5092-66

ACCESSION NR: AP5020125

(3) The more rapid flip-flop action by re-charging the detector capacitance requires a control-voltage source of considerably higher power. A "qualitative" experimental verification is claimed. Orig. art. has: 8 figures and 26 formulas.

ASSOCIATION: none

SUBMITTED: 04May64 ENCL: 00 SUB CODE: EC

NO REF SOV: 006 OTHER: 000

Card 2/2

L 2222-66 EWT(1)/EWA(h)

ACCESSION NR: AP5022985 UR/0103/65/026/008/1441/1450
621.374.325.4

16
B

AUTHOR: Molchanov, A. A. (Kiev)

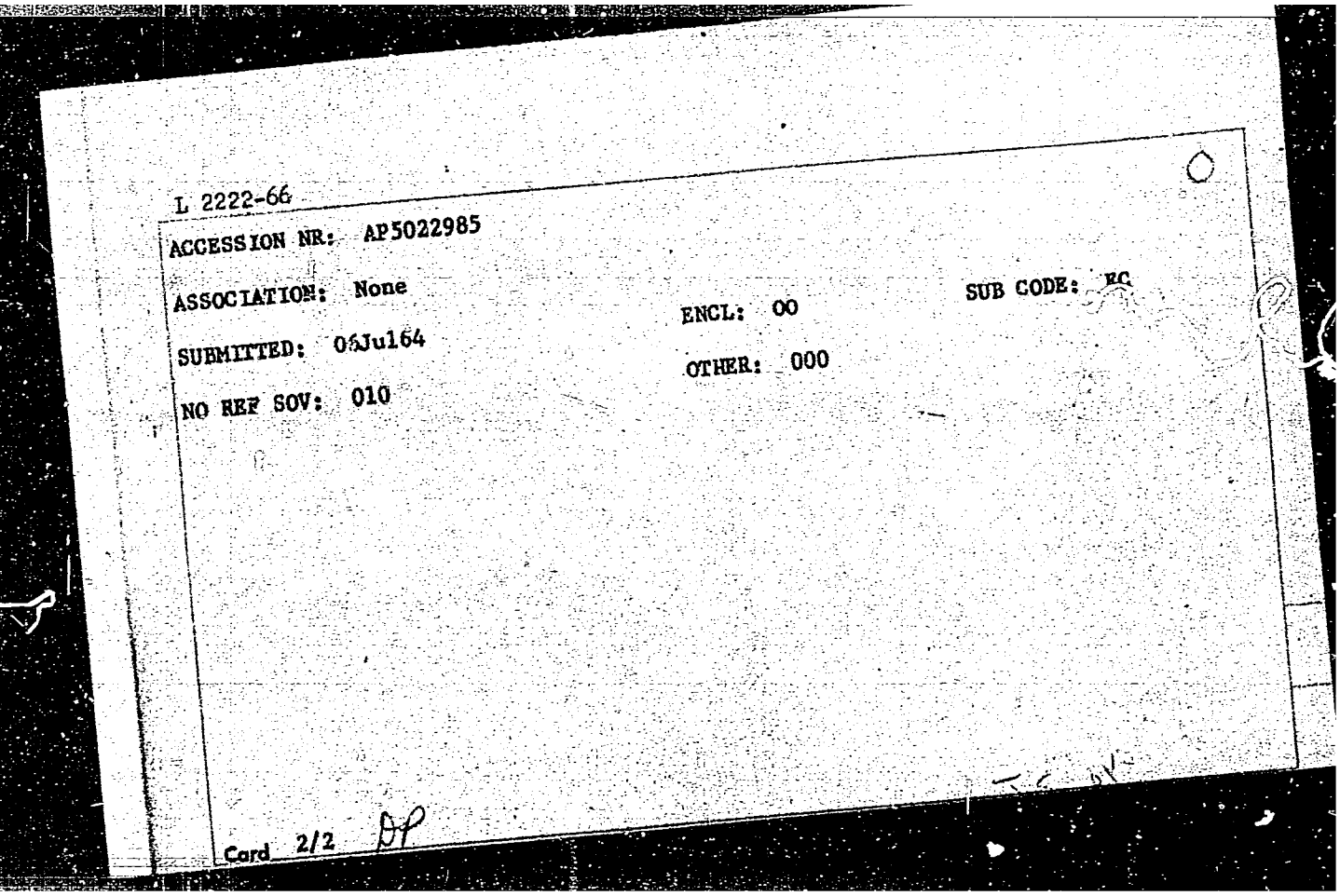
TITLE: An analysis of the dynamic behavior of a frequency-harmonic multistable component: the spectrotron 15

SOURCE: Avtomatika i telemekhanika, v. 26, No. 8, 1965, 1441-1450

TOPIC TAGS: harmonic oscillator, frequency stability, spectrotron

ABSTRACT: In view of the numerous potential uses for multistable components it is important to develop a detailed analysis of their dynamic processes. A complete analysis of spectrotron-type components is quite difficult because of the presence of essentially nonlinear loops. The present paper establishes and justifies an idealized spectrotron model with internal feedback which makes possible a comprehensive investigation of spectrotron operation. The low order of equations describing the spectrotron makes possible the application of the phase plane method to estimate of the control pulse parameters, and the determination of the mode and duration of transient processes allowing for the permissible values of the "stabilization" coefficient of the equilibrium states stability region. Orig. art. has: 26 formulas and 6 figures.

Card 1/2



L 2222-66

ACCESSION NR: AP5022985

ASSOCIATION: None

SUBMITTED: 06Jul64

NO REF SOV: 010

ENCL: 00

OTHER: 000

SUB CODE: EC

Card 2/2

ACC NR: AP6026306 (A,N) SOURCE CODE: UR/0288/66/000/001/0112/0121

AUTHOR: Molchanov, A. A.; Mazur, S. M.

ORG: Institute of Mathematics with Data-processing Center, Siberian Department, AN SSSR, Novosibirsk (Institut matematiki s vychislitel'nym tsentrom, Sibirskogo otdeleniya AN SSSR).

TITLE: Steady mode of operation of a spectrotron with controllable capacitance of the pn junction

SOURCE: AN SSSR. Sibirskoye otdeleniya. Izvestiya. Seriya tekhnicheskikh nauk, no. 1, 1966, 112-121

TOPIC TAGS: spectrotron, third order differential equation, nonlinear differential equation, pn junction, circuit parameter

ABSTRACT: An analysis is given of the steady mode of operation of a spectrotron, in the form of a nonlinear series-parallel circuit with controllable p-n junction capacitance and internal voltage feedback. The circuit represents a nonautonomous system described by a third-order nonlinear differential equation. It is assumed that the circuit parameters are selected such that parametric resonance cannot occur and only principal resonance takes place. A somewhat idealized circuit is introduced in order to offset the mathematical difficulties associated with the third-order nonlinear equation. It is shown that the voltage resonance in the equivalent series-connected

Card 1/2 UDC: 681.142.67:621.374.3

ACC NR: AP6026306

circuit leads to a transformation of the voltage in the parallel LC circuit. A transformation coefficient, introduced in the analysis, is shown to characterize the voltage amplification only in the absence of parametric excitation; in the presence of parametric excitation, the nature of the amplification becomes more complex. It is also shown that the assumption of a high Q-factor of the circuit makes it possible to study each individual spike of the resonance characteristic and greatly facilitates the analytical determination of the stability region of the equilibrium states and their coordinates. Orig. art. has: 16 formulas, 2 tables, and 6 figures.

SUB CODE: 09,12/ SUBM DATE: 14Oct64/ ORIG REF: 004

Card 2/2

ACC NR: AP6033215 SOURCE CODE: UR/0142/66/009/004/0483/0491

AUTHOR: Molchanov, A. A.

ORG: none

TITLE: Parametric excitation of a spectrotron with the controlled capacitance of p-n junction

SOURCE: IVUZ. Radiotekhnika, v. 9, no. 4, 1966, 483-491

TOPIC TAGS: spectrotron, p n junction, electronic circuit, electric capacitance

ABSTRACT: The subharmonic excitation of a spectrotron, which consists of a series-parallel circuit with controlled p-n junction capacitance and internal voltage feedback, was investigated using asymptotic methods of the nonlinear oscillation theory. A series of theoretical relations which permit the determination of steady-state conditions (conditions of a multi-stable element) was found. These steady state conditions were characterized by dynamic symptons such as the frequency of harmonic oscillations and the static bias voltage applied to the p-n junction. Excitation characteristics were plotted whose compatibility with those taken experimentally was satisfactory. Orig. art. has: 5 figures and 7 formulas.

SUB CODE: 09/ SUBM DATE: 07Dec64/ ORIG REF: 006/

Card 1/1 UDC: 621.373.5.933

L 29210-66 EWT(1)

ACC NR: AP6008282 SOURCE CODE: UR/0109/66/011/003/0456/0464

AUTHOR: Molchanov, A. A.; Tanichev, I. N. 23 B

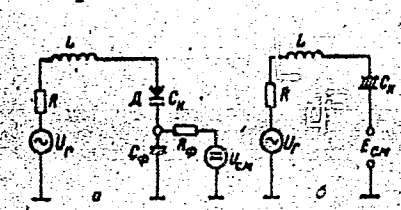
ORG: none

TITLE: Forced oscillations in nonlinear circuits with controlled p-n-junction capacitance

SOURCE: Radiotekhnika i elektronika, v. 11, no. 3, 1966, 456-464

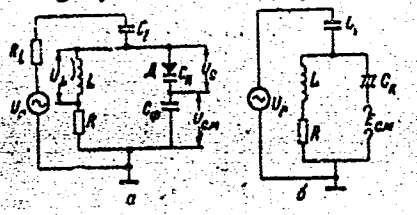
TOPIC TAGS: pn junction, pn junction capacitor, semiconductor capacitor

ABSTRACT: Nonlinear series and series-parallel circuits (see figure) with controlled p-n-junction capacitance are simplified and described by second-order differential equations. The equations are solved by the Bogolyubov-Mitropol'skiy method, and



Physical Equivalent

Series circuit with controlled p-n-junction capacitance



Physical Equivalent

Series-parallel circuit with controlled p-n-junction capacitance

Card 1/2 UDC: 538.565.8

L 29210-66
ACC NR: AP6008282

approximate formulas are obtained for the stationary characteristics of the circuits. A theoretical amplitude-frequency characteristic of the series circuit is shown and is corroborated to some extent by an oscillogram. The formulas permit investigating resonance phenomena, particularly the fundamental and subharmonic resonances. The results hold true only for small-signal conditions. Orig. art. has: 5 figures and 31 formulas.

SUB CODE: 09 / SUBM DATE: 07Dec64 / ORIG REF: 007

Card 2/2 CC

L 29498-66 EWT(1)/T IJP(c)

ACCESSION NR: AP6012477 SOURCE CODE: UR/0181/66/008/004/1156/1158

AUTHOR: Molchanov, A. G.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

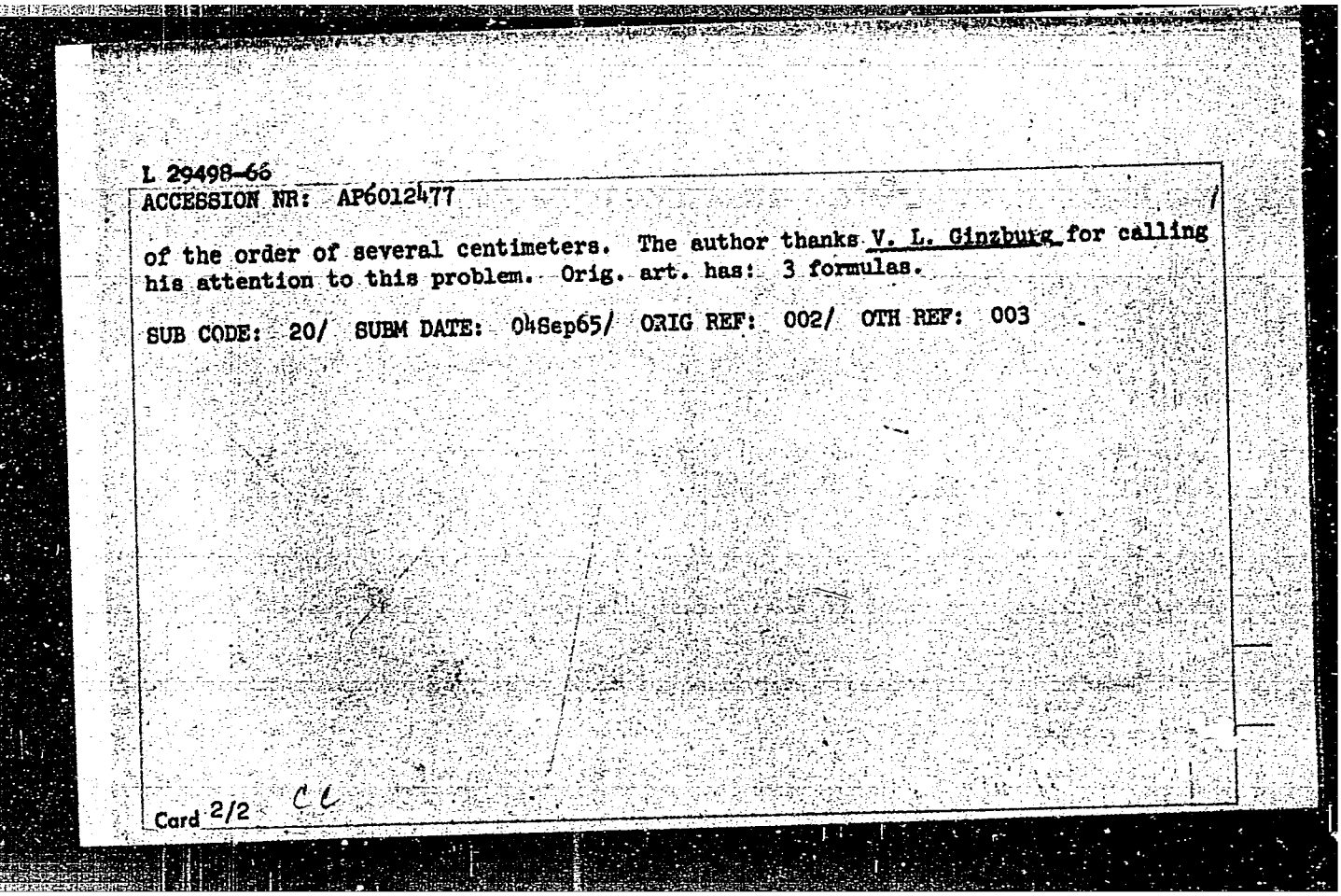
TITLE: Natural optical activity of higher orders in crystals

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1156-1158

TOPIC TAGS: optic activity, optic crystal, crystal anisotropy, dielectric constant, tensor, optic dispersion, crystal symmetry, double refraction

ABSTRACT: The author considers second-order gyrotropy in crystals, which is described by a fully symmetrical pseudotensor of fourth rank constituting the next higher term in the expansion of the complex dielectric tensor in terms of the wave vector. All the nonzero components of this tensor are determined for all the crystal classes that admit of natural optic activity (spatial dispersion). It is shown that for crystal classes C_{3v}, C_{4v}, C_{3h}, and D_{3h}, in which there is no gyrotropy of first order, the grotropy is always accompanied by birefringence, and since the gyrotropy of second order is usually approximately 10^4 times smaller than that of first order, it is necessary to choose for its observation crystals with thickness

Card 1/2



L 29498-66
ACCESSION NR: AP6012477

of the order of several centimeters. The author thanks V. L. Ginzburg for calling his attention to this problem. Orig. art. has: 3 formulas.

SUB CODE: 20/ SUBM DATE: 04Sep65/ ORIG REF: 002/ OTH REF: 003

Card 2/2 CC

L 9778-66 EWT(d)/EWT(1)/EEC(k)-2/FCC RB/GW/WS-2

ACC NR: AP5025490 SOURCE CODE: UR/0203/65/005/005/0955/0958

AUTHOR: Molchanov, A. O.

ORG: Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation, AN SSSR (Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR)

TITLE: Amplitude distribution of an enveloping impulse signal on the output of a narrow-band system

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 5, 1965, 955-958

TOPIC TAGS: electronic signal, signal transmission, atmospheric sounding, amplitude modulation

ABSTRACT: The amplitude analysis of an impulse signal of atmospheric-noise type consisted to date in receiving such a signal on a narrow-band amplifying system with subsequent analysis of the output signal. This method was found to be unsatisfactory for the case of weak signals. In such cases the amplitude distribu-

1/2 UDC: 550.388.2

L 9778-66

ACC NR: AP5025490

tion of the enveloping impulse signals on the output of a narrow-band system were related to the amplitude distribution of the impulses on the input. Satisfactory results were obtained under the following simplifying assumptions: 1) The impulse peak values were considered greater than a fixed level and their distribution was assumed to be a smooth single-valued function which was stationary during the period of observation. 2) The impulses were considered to be sufficiently small. 3) The output phase distribution of those impulses whose peak values were sufficiently small was considered to be uniform. Orig. art. has: 1 figure and 6 formulas.

SUB CODE: 17, 09 SUBM DATE: 27Jan65/ NR REF SOV: 006/ OTHER: 001

BC

2/2

MOLCHANOV, A.A.

Results of a competition between enterprises of nonferrous metallurgy on "Providing the maximum output of sulfuric acid in existing plants for a better utilization of metallurgical equipment and the equipment of sulfuric acid plants." TSvet.met. 38 no.3:95-96 Mr '65. (MIRA 18:6)

MOLCHANOV, Aleksandr Alekseyevich; GUBAREVA, Vera Aleksandrovna; KABANOV, A.Ye., otv. red.

[Formation and growth of oak on cutovers in the forest-steppe] Formirovanie i rost duba na vyrubkakh v lesostepi. Moskva, Nauka, 1965. 254 p. (MIRA 18:9)

MOLCHANOV, Aleksandr Alekseyevich; KABANOV, N.Ye., doktor biol. nauk, prof., otv. red.

[Scientific foundations of forest management in the oak-dominant woods of the forest steppe] Nauchnye osnovy vedeniia khoziaistva v dubravakh lesostepi. Moskva, Nauka, 1964. 253 p. (MIRA 17:9)

MOLCHANOV, A.G.

Experimental testing of the postulates of the special theory of relativity. Usp. fiz. nauk 83 no.4:753-755 Ag '64. (MIRA 17:9)

MOLCHANOV, A.G., inzh.

Dust removal measures in asbestos enriching plants. Bezop.truda v prom. 2 no.5:30-31 My '58. (MIRA 11:4)
(Dust--Removal) (Asbestos)

L 07866-67 EWT(m)/EWP(v)/EWP(t)/ETI/EWP(k) IJP(c) JD/HM/JG

ACC NR: AP6033515 SOURCE CODE: UR/0413/66/000/018/0148/0148

INVENTOR: Molchanov, A. I.; Kurkina, M. L.

ORG: none

TITLE: A solder for soldering niobium and molybdenum to various materials. Class 49, No. 186263

SOURCE: Izobret prom obraz tov zn, no. 18, 1966, 148

TOPIC TAGS: niobium, molybdenum, niobium soldering, molybdenum soldering, solder, nickel containing solder

ABSTRACT: This Author Certificate introduces a solder for soldering niobium and molybdenum to various materials. To obtain a strong vacuum-tight joint, 17—41% nickel is added to the solder composition. The remainder is 35—50% vanadium and 24—33% niobium.

SUB CODE: 13/ SUBM DATE: 19Jun65/ ATD PRESS: 5101

Joining of dissimilar metals

Card 1/1 bc UDC: 621.791.36

MOLCHANOV, A. K.

KHOZYAYSTVENNYY RASCHET V STROITEL'STVE I BANKOVSKIY KONTROL'. MOSKVA, GOSFINIZ DAT, 1952 100 p.

At head of title: A.N. MOLCHANOV, L. I. PERELMAN

MOLCHANOV, A.K.; NOVITSKIY, N.S.

Reusable triangular packing cases. Kons. i ov. prom. 13 no.11: 44-45 N '58. (MIRA 11:11)

1. Glavnyy inzhener Khersonskogo konservnogo zavoda imeni 8 marta (for Molchanov). 2. Nachal'nik fabrikatnogo tsekha Khersonskogo konservnogo zavoda imeni 8 marta (for Novitskiy).
(Boxes)

MOLCHANOV, A.I.

Role of shelterbelts in increasing soil moisture due to snow accumulation. Trudy Ukr. NIGMI no.3:33-39 '55. (MLRA 9:10)

Gidrometeorologicheskaya observatoriya Kamennaya Step'.
(Windbreaks, shelterbelts, etc.) (Soil moisture) (Snow)

MOLCHANOV, A.L.

Water absorbing characteristics of tilled and fallow Chernozem soils used for forest plantations. Trudy KazNIIGMI no.5:8-15 '55.(MLRA 9:10)
(Soil absorption) (Chernozem soils)

K

USSR / Forestry. Forest Cultures.

Abs Jour : Ref Zhur - Biologiya, No 18, 1958, No. 82232

Author : Molchanov, A. I.
Inst : Kazakh Scientific Research Hydrometeorological Inst.
Title : Measuring Wind Conditions in the Field Shelter Forest Preserve

Orig Pub : Tr. Kazakhsk. n.-i. gidromet. in-ta, 1956, vyp 7, 40-56

Abstract : Investigations made by the Kamennostepnaya Hydrometeorological Observatory have shown that a reduction in wind velocity in the blown strip is observed on spaces split into 40 - 50 altitudes. The length of the action of unblown strips is limited to 10 - 15 altitudes. It is, however, sufficiently effective to even have, for the 25 - 50 ha. spaces between strips, unblown belts, the 100 - 120 ha. field area of which should be sheltered

Card 1/3

33

USSR / Forestry. Forest Cultures.

Abs Jour : Ref Zhur - Biologiya, No 18, 1958, No. 82232

K

by strips which are blown through. The most effective strips are 20 - 30% windswept with maximum openness in the lower portion. In this case the air current is significantly screened, reducing the effectiveness of eddying while increasing the meteorological efficiency of the strip. A mathematical computation of the effectiveness of the strip by A. R. Konstantinov and the author's experimental data show that the wind velocity parallel to the strip drops in relation to the breaking force of the strip, and the strip's mean wind-shelter effectiveness with side-breaking area of 1.5 m is equal to 20 - 25% in the gap zone of 100 m. It was shown that the wind velocity above the belt tops in the forest steppe and the steppe regions can be lowered by 21%, however increased precipitation can be

Card 2/3

USSR / Forestry. Forest Cultures. K

Abs Jour : Ref Zhur - Biologiya, No 18, 1958, No. 82232

of help solely to large strips greater than 200 - 250 km in length. -- I. N. Zaikina

Card 3/3

Country : USSR
Category : Soil Science. Physical and Chemical Properties of Soils. J

Abs Jour : RZhBiol., No 6, 1959, No 24593

Author : Konstantinov, A. R.; Molchanov, A. L.
Inst : Kazakhstan Scientific Research Hydrometeorological Institute.
Title : Evaluation of Evaporation Changes and Water Balance of the Soils in the Steppe and Forest-and-Steppe Zones of the USSR European Territory under the Influence of Agricultural and Forest Amelioration Measures.
Orig Pub : Tr. Kazakhsk. n.-i. gidrometeorol. in-ta, 1957, vyp. 8, 64-93

Abstract : In the past, during unscientific agriculture, about 86 percent (353 mm) was consumed by evaporation from the total amount of precipitation for these territories, 11 percent (46 mm) was ...

Card : 1/2

Country : USSR
Category : Soil Science. Physical and Chemical Properties of Soils. J

Abs Jour : RZhBiol., No 6, 1959, No 24593

Author :
Inst :
Title :

Orig Pub :

Abstract : used up for surface drainage and 3 percent (14 mm) flowed underground. Approximate computations of the water balance for the next decades were presented. -- S. A. Nikitin

Card : 2/2

M-1

USSR/Cultivated Plants - General Problems.

Abs Jour : Ref Zhur - Biol., No 9, 1958, 39138

Author : Molchanov, A.L., Duginov, V.I.

Inst : Kazakh Scientific Research Hychometeorological Institute

Title : On the Division of Evaporation into Productive and Unproductive Types in Field Protective Forest Cultivation.

Orig Pub : Tr. Kazakhsk. n.-i. gidrometeorol. in-ta, 1957, vyp. 8, 94-99.

Abstract : The coefficient of turbulent exchange diminishes in the center of a field, located between forest strips, in comparison with an open place (Kamennaya (Stony) steppe) by 30-35%, and dq/dz between the levels of 20 and 200 cm increases by 18-20%. In connection with this, it was presumed that the unproductive evaporation on a fallow field between forest strips would be lower by 15-20% than in an

Card 1/2

MOLCHANOV, A. M.

MOLCHANOV, A. M. -- "Criteria of the Discreteness of the Spectrum of a Second-Order Differential Equation." Sub 20 Feb 52, Sci Res Inst of Mechanics and Mathematics, Moscow Order of Lenin State U imeni M. V. Lomonosov. (Dissertation for the Degree of Candidate in Physicomathematical Sciences).

SO: Vechernaya Moskva January-December 1952

MOLCHANOV, A.M.

Mathematical Reviews
Vol. 15 No. 3
March 1954
Analysis

7-9-54
LL

Molčanov, A. M. On conditions for discreteness of the spectrum of self-adjoint differential equations of the second order. Trudy Moskov. Mat. Obšč. 2, 169–199 (1953). (Russian)

The author considers the question of discreteness or non-discreteness of the spectrum of the eigenvalue problem concerning the equation (1) $-\Delta u+pu=\lambda u$, where the function p is supposed uniformly bounded below in the whole n-dimensional space E^n. The author first considers the problem in the whole of E^n and obtains a complete answer to the question which can be stated as follows. I. a) For the non-discreteness of the spectrum it is necessary that for every $\epsilon>0$ there exist a sequence $\{\mathfrak{D}_k\}$ of disjoint cubes of equal side length, and a sequence $\{\mathfrak{F}_k\}$ of closed subsets of $\{\mathfrak{D}_k\}$ with $c_n(\mathfrak{F}_k)\leq\epsilon c_n(\mathfrak{D}_k)$ ($c_n(\mathfrak{A})$ denotes the capacity of $\mathfrak{A}$ in E^n) such that $p_k=\int_{\mathfrak{D}_k-\mathfrak{F}_k}p\,dx$ is bounded for $k\to+\infty$. b) It is sufficient for the non-discreteness of the spectrum that the sequences $\{\mathfrak{D}_k\}$ and $\{\mathfrak{F}_k\}$ satisfying the above conditions exist for at least one ϵ smaller than a constant ϵ_0, ϵ_0 depending only on the dimension n.

An evaluation of ϵ_0 is given which is certainly not the best possible. In the one-dimensional case the "exceptional" sets $\mathfrak{F}_k$ and the notion of capacity are superfluous and Statement I takes the simpler form: I'. A necessary and sufficient condition for the non-discreteness of the spectrum is the existence of a disjoint infinite sequence of intervals $\mathfrak{D}_k$ of equal lengths such that $\int_{\mathfrak{D}_k}p\,dx$ is bounded.

The author then applies his methods and results to the case of equation (2) $-\Delta u=\lambda u$ ($p\equiv 0$) in a non-bounded domain G of E^n with the boundary condition $u\neq 0$ on the

boundary Σ of $\mathfrak{G}$. His main result can be stated as follows. II. A necessary and sufficient condition for the non-discreteness of the spectrum is the existence of a sequence $\{\mathfrak{D}_k\}$ of disjoint cubes of equal side lengths such that $c_n(\mathfrak{D}_k - \mathfrak{G}) \geq \epsilon_0 c_n(\mathfrak{D}_k)$ where ϵ_0 has the same significance as in Ib.

For special kinds of domains $\mathfrak{G}$ the condition becomes much simpler: II'. The existence of an infinite sequence $\{\mathfrak{D}_k\}$ of disjoint cubes contained in $\mathfrak{G}$ is necessary and sufficient for the non-discreteness of the spectrum when 1) the dimension $n=2$, and $\mathfrak{G}$ is simply connected; 2) the dimension $n \geq 3$ and the boundary Σ is connected, smooth, and of uniformly bounded curvature.

In this paper significant progress is made in the treatment of a classical problem which started with the work of H. Weyl and has been continued more recently in the work of Titchmarsh, Friedrichs, and Rellich. In view of the interest of the results, the reviewer feels that the following comments and corrections are indicated.

For Statement I, the starting idea is to divide the whole space into a net of cubes of equal side lengths D. The union of spectra (with multiplicities counted) for equation (1) for all the cubes with free boundary condition ($du/dn=0$) then minorates the spectrum in the whole space, whereas the union of spectra in all cubes with fixed boundary condition ($u=0$) majorates it. This idea is not new; it was the basis of classical results of H. Weyl and R. Courant concerning the asymptotic distribution of eigenvalues. The essential points which allow the author to obtain his general statements are the use of capacities of sets and the following lemma. Lemma. Let μ_k and λ_k be the smallest eigenvalues of equation (1) in a cube of side length D with the boundary condition $du/dn=0$ or $u=0$ respectively. If $p \geq 0$ in the cube, then there exist two constants A and B depending only on the dimension n (and not on p) such that $\mu_k \leq \lambda_k \leq A\mu_k + B/D^2$.

In the paper the values of the constants A and B ($A=B=2^{(n+1)^2}$) are not the best possible; if it were possible to choose the constant $A=1$, the results of the paper could be extended also to p non-bounded. The restriction that p be uniformly bounded below is rather a disadvantage in view of the intention of the author to apply his results to problems in quantum mechanics where p is usually non-bounded below. In this respect the recent results of Friedrichs [see Comm. Pure Appl. Math. 3, 439–449 (1950); these Rev. 13, 133] have the advantage of allowing one to treat some cases where p is unbounded below. However, under the limitations imposed by the author, in particular for equation (2), the results of the paper give as immediate consequences all previously known results [for example, F. Rellich, Courant Anniversary Volume, Interscience, New York, 1948, pp. 329–344; these Rev. 9, 355]. It may be added here that the simplified necessary and sufficient conditions are valid for much larger classes of domains than is explicitly stated by the author, in particular; for $n=2$, it is enough that the components of the complement of $\mathfrak{G}$ have diameters $\geq \alpha$ for some $\alpha>0$.

In his development the author is rather vague on several points which may lead to misunderstandings. These may be clarified as follows.

1. In introducing the capacity c_n in n-dimensional space, the author does not seem to realize that the case $n=2$ is an exceptional one because there is no suitable notion of

(3)

capacity with respect to the whole plane as there is one for every $\mathfrak{E}^n$ with $n \geqq 3$. This can be easily remedied by considering in Statements I and II that the capacities $c_k(\mathfrak{F}_k)$ and $c_k(\mathfrak{D}_k)$ are actually the logarithmic capacities of $\mathfrak{F}_k$ and $\mathfrak{D}_k$ with respect to a circle C_k concentric with $\mathfrak{D}_k$ and with radius equal to twice the side length D_k.

2. In passing to the consideration of the spectrum in a domain the author makes two general statements which may be misleading: a) he says that his methods are applicable and similar results can be obtained for the case of any self-adjoint boundary conditions imposed on the boundary Σ. However, it seems to the reviewer that this is true only for the boundary condition $u=0$; that for other boundary conditions one could not expect similar results is shown already by the fact that there are bounded domains in the plane with very smooth boundary except at one boundary point for which the spectrum of equation (2) with boundary condition $du/dn=0$ is non-discrete. b) The author suggests that the problem in a domain $\mathfrak{G}$ with boundary condition $u=0$ can be transformed into a problem in the whole of $\mathfrak{E}^n$ (so that Statement I is applicable) by putting $p=+\infty$ in the complement of $\mathfrak{G}$. However, a direct application of this idea is not always feasible due to the possibility that some parts of Σ may belong to the interior of the closure $\bar{\mathfrak{G}}$ (e.g. in the case of a slit). However, the idea can be applied and Statement I becomes valid for the spectrum in $\mathfrak{G}$ if the condition $\mathfrak{F}_k \supset \mathfrak{D}_k - \mathfrak{G}$ is imposed additionally on the exceptional sets $\mathfrak{F}_k$. Statement II is obtained in precisely this way from Statement I.

N. Aronszajn.

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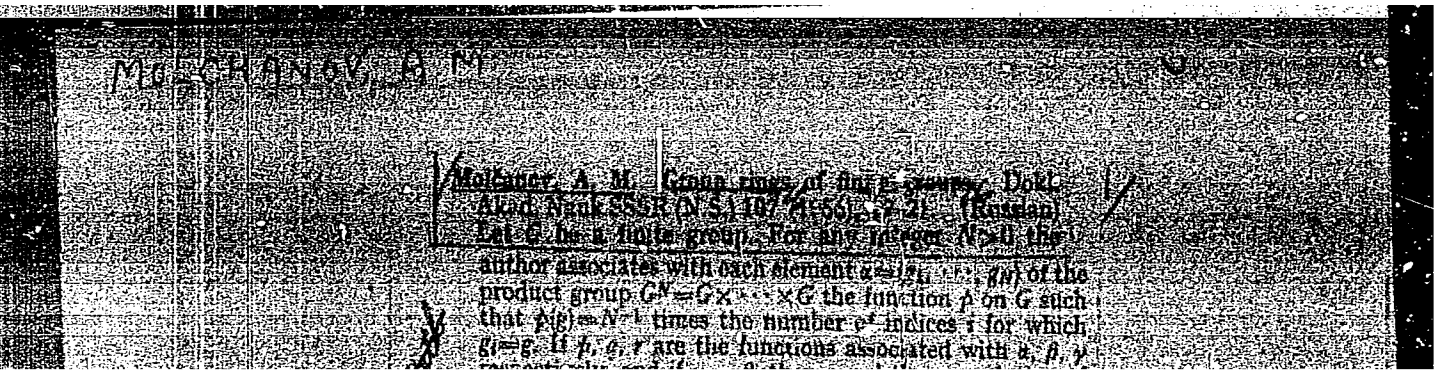
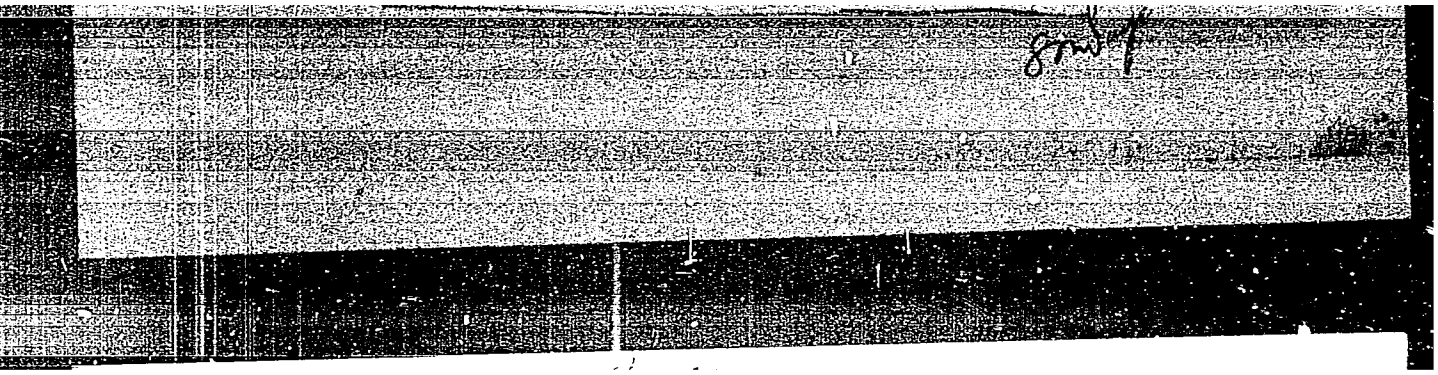


MOLCHANOV, A. M.

Molčanov, A. M. Group rings of finite p-groups. Dokl. Akad. Nauk SSSR (N.S.) 107 (1956), 22–24. (Russian)

Let G be a finite group. For any integer $N>0$ the author associates with each element $g=(g_1, \cdots, g_N)$ of the product group $G^N=G\times\cdots\times G$ the function λ on G such that $\lambda(g)=N-1$ times the number of indices i for which $g_i=g$. If λ, σ, τ are the functions associated with α, β, γ



Molchanov, A.M.

20-6-6/42

AUTHOR: MOLCHANOV, A.M.

TITLE: Finite Sets and Scalar Products (Konechnyye mnozhestva i skalyarnoye proizvedeniye)

PERIODICAL: Doklady Akad.Nauk, SSSR, 1957,Vol.116,Nr 6,pp.920-922 (USSR)

ABSTRACT: The author shows that the scalar product can be obtained by passage to the limit. For the subsets of finite sets the notion of the "nearness" is introduced, as a measure of the "nearness" there is taken the number of certain coinciding elements. Under increase of the number of elements of the finite set this notion passes over into the notion of the scalar product, so that the latter one appears as an asymptotic behavior of the measure of "nearness" . The proof is based on probability-theoretical methods and is not presented. There is 1 Slavic reference.

PRESENTED: By M.V.Keldysh, Academician, May 8, 1957

ASSOCIATION: Section for Applied Mathematics, Institute of Mathematics imeni V. A. Steklov, Acad.Sci.USSR (Otdeleniye prikladnoy matematiki matematicheskogo instituta V.A.Steklova Akademii Nauk SSSR)

SUBMITTED: May 7, 1957

AVAILABLE: Library of Congress

Card 1/1

BIRYUKOV, N.S.; MOLCHANOV, A.M., prof., otv.red.; IVANOV, V.V., red. izd-va; ANTSELOVICH, M.Ya., red.izd-va; DOROKHINA, I.N., tekhn.red.

[Method of studying the zone of aeration and ground waters in hydrological forestry research] Metodika izucheniia zony aeratsii i gruntovykh vod pri lesogidrologicheskikh issledovaniiakh. Moskva, Izd-vo Akad.nauk SSSR, 1959. 65 p. (MIRA 13:1)

(Forest influences) (Water, Underground)

~~10(2)~~ 20.4000

AUTHOR: Molchanov, A.M.

68153
SOV/20-129-6-16/69

TITLE: The Boundedness of the Variation of Continuous Solutions of the System of Equations of Hydrodynamics

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 6, pp 1257-1260 (USSR)

ABSTRACT: It was the aim of the present article to prove the boundedness of the variation of the solution of the system of equations of hydrodynamics $\frac{\partial u^\alpha}{\partial t} + \frac{\partial U^\alpha}{\partial x} = 0$. For the case of Lagrangian coordinates $u^{(1)} = u$, $u^{(2)} = v$, $u^{(3)} = E + \frac{u^2}{2}$, $U^{(1)} = p$, $U^{(2)} = -u$, $U^{(3)} = pu$ holds, and u denotes velocity, v the specific volume, p pressure, $E = E(p,v)$ the density of the inner energy. The initial data are assumed to have a limited variation, and the solution is supposed to be continuous in the strip $0 \leqslant t \leqslant t_0$, $-\infty < x < +\infty$. The most important particular features of the system of equations of hydrodynamics occur here. From the systems of hyperbolic equations of the type $\frac{\partial u^\alpha}{\partial t} + U^\alpha_\beta \frac{\partial u^\beta}{\partial x} = 0$ (where U^α_β are functions of the variables u^α)

Card 1/4

The Boundedness of the Variation of Continuous Solutions of the System of Equations of Hydrodynamics

SOV/20-129-6-16/69

it is possible to segregate a special class of hydrodynamic equations, which must contain functions which, in a certain respect, play the part of entropy in hydrodynamics. These "entropy systems" form a very restricted class among the general hyperbolic systems; for all these systems the proof of the boundedness of the variation of the solution mentioned by the author holds. These "entropy systems", by the way, take up a position in the middle between the linear and the general systems. The proof is sketched out. By differentiation of the system of hyperbolic equations a system of equations is obtained for v^α: $\frac{\partial v^\alpha}{\partial t} + \frac{\partial}{\partial x}\left(U^\alpha_\beta v_\beta\right)$. For the purpose of determining the integral equations the latter system is replaced by a simple diagonal system for other functions $\varphi^\mu = l^\mu_\alpha v^\alpha$. After some steps one obtains (6): $\frac{\partial \varphi^\mu}{\partial t} + \Lambda^\mu_\alpha \frac{\partial \varphi^\alpha}{\partial x_\mu} + \frac{\partial \Lambda^\mu_\alpha}{\partial x} \varphi^\alpha = C^\mu_{\alpha\beta}\varphi^\alpha\varphi^\beta$ with $\Lambda^\mu_\nu = l^\mu_\gamma U^\gamma_\delta m^\delta_\nu$ and $C^\mu_{\alpha\beta} = \left(\frac{\partial l^\mu_\gamma}{\partial u^\delta} - \frac{\partial l^\mu_\delta}{\partial u^\gamma}\right) \Lambda^\gamma_\varepsilon m^\delta_\alpha m^\varepsilon_\beta$. A certain arbitrariness may be used for an advan-

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tageous simplification of the structure of the tensor $C^{\mu}_{\alpha\beta}$. The solutions of the system of equations written down last become infinite already with a finite t_o, even if with $t = 0$ arbitrarily smooth initial data are assumed. Separation of the terms $C^{\mu}_{\alpha\beta}\varphi^{\alpha}\varphi^{\beta}$ obviously means separation of the non-compensatable portion of the quadratic form, i.e., that part which causes the solution to tend towards ∞ in the case of a finite t_o. The differences in the terms of the form $\frac{\partial \Lambda^{\mu}_{\alpha}}{\partial x}\varphi^{\alpha} = \frac{\partial \Lambda^{\mu}_{\alpha}}{\partial u^{\beta}} m^{r}_{\beta}\varphi^{\alpha}\varphi^{\beta}$ and $C^{\mu}_{\alpha\beta}\varphi^{\alpha}\varphi^{\beta}$ are pointed out. The "eigendifferential" $\delta\psi^{\mu_o} = l^{\mu_o}_{\alpha} du^{\alpha}$ and the pertinent equation in the system of equations written down last are called "entropy-like" if $\delta\psi^{\mu_o}$ is a complete differential, i.e., if $C^{\mu_o}_{\alpha\beta} = 0$ holds for all α and β. A system of the type $\frac{\partial u^{\alpha}}{\partial t} + U^{\alpha}_{\beta}\frac{\partial u^{\beta}}{\partial x} = 0$ is called hydrodynamic if it has at least one "entropy", and if in the non-entropy-like

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equations of system (6) the coefficients $C^{\mu}_{\alpha\beta}$ equal zero in the products of two arbitrary non-entropy terms $\varphi^{\alpha}\varphi^{\beta}$. In order that the system of the three equations be a system of hydrodynamics, it suffices for it to have one "entropy". Reference is made to a criterion for the stability of a system, which was set up by Lyapunov.

PRESENTED: August 15, 1959, by M.V.Keldysh, Academician

SUBMITTED: August 11, 1959

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S/020/61/136/005/005/032
C111/C222

16.3400

AUTHOR: Molchanov, A.M.

TITLE: Subdivision of Motions and Asymptotic Methods in the Theory of Nonlinear Oscillations

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No.5, pp. 1030 - 1033

TEXT: Let the undisturbed motion be described by

(1) $du/dt = (U)u$,

and the disturbed one by

(2) $dv/dt = U(v) + V(v)$,

where $V(\varepsilon, v) = \varepsilon V_1(v) + \varepsilon^2 V_2(v) + \ldots$. Let

(3) $u = u(w,t)$

be the solution of (1) satisfying the initial conditions $u|_{t=0} = u(w,0) = w$. If the solution of (2) is also written in the form (3), where w now is no longer constant but depends on t , and if then the time t does not

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Subdivision of Motions and Asymptotic Methods in the Theory of Nonlinear Oscillations

explicitly appear in the equation for w then this equation is called an evolution equation ; it describes slow variations of the system which are independent from the quick principal motion. In this case the author says that (2) admits a subdivision of motions. It is stated that the condition

(7) $$\frac{\delta V}{\delta u}U - \frac{\delta U}{\delta u}V = 0$$

where $\frac{\delta V}{\delta u}$ denotes a matrix the elements of which are the partial derivatives of the components of the vector V with respect to the components of the vector u , is necessary and sufficient for a subdivision of motions. If (7) is satisfied then the solution of (2) is given by

(8) $$v = u(w(t),t)$$

where $w(t)$ is the solution of

(9) $$dw/dt = V(w) \ .$$

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If especially U and V are linear functions then (7) is identical with the condition for the exchangeability of the matrices U and V.
Then it is proved that by a transformation of variables (2) can be brought to a form which permits a subdivision of motions. Namely there exists an asymptotic series $y = v + \varepsilon Q_1(v) + \varepsilon^2 Q_2(v) + \ldots$ so that the equation for y admits this subdivision. Here y satisfies the equation

(10) $$dy/dt = U(y) + \varepsilon Y_1(y) + \varepsilon^2 Y_2(y) + \ldots$$

where

(11) $$Y_n = \tilde{Y}_n + \frac{\delta Q_n}{\delta y} U - \frac{\delta U}{\delta y} Q_n ,$$

and $\tilde{Y}_n$ is a known function of y since it depends only on $V_1, V_2, \ldots, V_n$ and on the preceding coefficients $Q_1, \ldots, Q_{n-1}$; $\tilde{Y}_1$ especially equals $V_1(y)$.
In the special case, where the translation of $\tilde{Y}_n$ along the trajectories

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generates an almost periodic function of t the frequencies of which accumulate at zero, the author obtains an effective solution ; then it holds

$$(14) \qquad Y_n(w) = \lim_{T\to\infty} \frac{1}{T} \int_0^T \left(\frac{\partial u}{\partial w}\right)^{-1} \tilde{Y}_n(u)dt$$

$$(15) \qquad Q_n(w) = \lim_{T\to\infty} \frac{1}{T} \int_0^T (T - t) \left(\frac{\partial u}{\partial w}\right)^{-1} \left[\tilde{Y}_n(u) - Y_n(u)\right] dt$$

where $u = u(w,t)$ and it is integrated for a fixed w along the trajectory. There are 2 Soviet references.

PRESENTED: September 16, 1960, by M.V. Keldysh, Academician

SUBMITTED: September 9, 1960

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S/020/61/141/001/001/021
C111/C222

AUTHOR: Molchanov, A. M.

TITLE: Stability in the case of a neutral linear approximation

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no.1, 1961, 24-27

TEXT: The author investigates the stability of a system of differential equations the linear approximate system of which has a characteristic equation the one root of which lies on the imaginary axis and the other roots of which lie in the left-hand halfplane.

Let the considered system

$$\frac{du}{dt} = U(u) \qquad (1)$$

have the solution $u = u_0 = \text{const}$. The coordinate transformation $u = u_0 + \varepsilon x$ with a small ε changes (1) in

$$\frac{dx}{dt} = A(x) + \varepsilon A_1(x) + \frac{\varepsilon^2}{2!} A_2(x) + \ldots \qquad (2)$$

in the neighborhood of u_0, where the matrix $A(x)$ has purely imaginary

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eigenvalues. For (2) the "separation of motions" is carried out according to (Ref. 1: A. M. Molchanov, DAN 136, no. 5 (1961)), i.e. the variable

$$y = x + \varepsilon Q_1(x) + \frac{\varepsilon^2}{2!} Q_2(x) + \ldots \qquad (3)$$

is introduced so that the new system

$$\frac{dy}{dt} = A(y) + \varepsilon B_1(y) + \frac{\varepsilon^2}{2!} B_2(y) + \ldots \qquad (4)$$

admits a "separation of motions". The formulas according to which Q_n and B_n are calculated are given in (Ref.1). Now in (4) instead of y^k the author introduces the new variable $\eta^k = |y^k|^2 = y^k y^{k*}$ (y^{k*} is conjugate complex to y^k) whereby (4) changes to the system

$$\frac{d\eta^k}{dt} = -\eta^k (E_{k\alpha} \eta^{\alpha}) , \qquad (10)$$

where it is summed only over α and $E_{k\alpha}$ contains the parameter ε

in the square. Now it is stated that (4) is stable then and only then if (10) is stable in the cone $\eta^k \geqslant 0$. For (10) the author obtains the following criterion of stability: In order that (10) is stable in the cone $\eta^k \geqslant 0$ it is necessary and sufficient that in the interior and on the boundary of the cone there exists no neutral and instable ray. Here solutions $\eta^k = \eta_o^k \eta(t)$ denote invariant rays of the system. Substituting that into (10) then one obtains

$$\frac{d\eta}{dt} = -E\eta^2, \quad \eta(0) = 1 \qquad (13)$$

$$\eta_o^k \left[E_{k\alpha}\eta_o^\alpha - E\right] = 0 \qquad (14)$$

where E is a parameter being analogous to the eigenvalue in linear systems and the sign of which decides on the stability of the ray ($E > 0$ -- stable, $E < 0$ -- instable, $E = 0$ -- neutral).