USSR

UDC: 8.74

CHAVCHANIDZE, V. V., editor

"Some Problems of Pattern Recognition and the Theory of Graphs"

Tbilisi, Nekotoryye zadachi raspoznavaniya obrazov i teorii grafov--sbornik statey. In-t kibernet. AN GruzSSR (cf. English above--collection of works. Institute of Cybernetics, Academy of Sciences of the Georgian SSR), "Metsnereba", 1972, 88 pp, ill. 28 k. (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V677 K)

Translation: The collection is devoted to questions of the theory of pattern recognition and three specific problems in the theory of graphs. The book deals with problems of pattern identification, distinguishing images, classification, and methods of solving them. Particular attention is given to methods of estimating parameters in computer identification of objects and arranging features in order of preference. Various resolving rules for arranging features are considered, and a method is proposed for introducing quantitative characteristics to evaluate qualitative features.

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CHAVCHANIDZE, V. V., TKEMALADZE, N. T.

"Method of Installments in the Problem of Identification of Objects"

Nekotor. zadachi raspoznavaniya obrazov i teorii grafov [Some Problems from Pattern Recognition and Graph Theory -- Collection of Works], Tbilisi, Metsniyereba Press, 1972, pp 5-17 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V693 by V. Mikheyev)

Translation: An installments method is studied for solution of the following problem of identification of objects. A finite set of objects of the same class $\theta=\{\theta_i\}$, $i=1,2, \ldots, m$, is given. Each object is characterized by a certain set of parameters $P=\{P_j\}$, $j=1,2, \ldots, n$. The set of all possible values of parameter P_j is represented by Q_j. It is considered that a number of elements for all sets $Q_1, Q_2, \ldots, Q_n$ is the same. The value of the jth parameter of the ith object is represented as Q_{ij}. The set of specific values of parameters $\overline{Q}_i=q_{i1}, q_{i2}, \ldots, q_{in}$, where $q_{ii} \quad Q_i$, $q_{i2} \quad Q_2, \ldots, q_{in} \quad Q_n$, is one of the specific realizations of object θ_i and

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CHAVCHANIDZE, V. V., TEKMALADZE, N. T., Nekotor. zadachi raspoznavaniy obrazov i teorii grafov, Tbilisi, Metsniyereba Press, 1972, pp 5-17

is called a message concerning object θ_i. Each object θ_i can be represented by a set of specific realizations θ_{ii}, θ_{iz}, ..., $\theta_{i\mu}$. This means that μ different messages can be produced concerning object θ_i. The problem is that of identification of realizations $\tilde{\theta}_{ix}$ with one of the realizations of the objects θ_1, θ_2, ..., θ_m. 18 Biblio. Refs.

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CHAVCHANIDZE, V. V., TKEMALADZE, N. T.

"Installments Method for Estimation of Parameters of Objects"

Nekotor. zadachi raspoznavaniya obrazov i teorii grafov [Some Problems from Pattern Reconigition and Graph Tehory -- Collection of Works], Tbilisi, Metsniyereba Press, 1972, pp 18-30 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V694 by V. Mikheyev)

Translation: The finite set of parameters $P=\{P_j\}$, $j=1, 2, \ldots, n$, is studied, characteristizing object θ_i, $i=1,2, \ldots, m$. It is assumed that there is an algorithm for identification of the objects, written according to the installments method. $P_j : P_j \in P$ is considered a basic parameter (i.e., a parameter, any value of which from the set $\theta=\{\theta_i\}$, $i=1,2,\ldots,m$ sets apart a set θ' in which the number of elements $m'<m$. According to the installments method, if the values of parameter $P_j \in P$, given in two mappings of objects θ_i and θ_x agree, the installment $\phi_i>0$ is written with possible change of these values -- introduction of possible change $\phi_j'>0$, while otherwise, we write the installment $\overline{\phi}_j>0$.

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CHAVCHANIDZE, V. V., TKEMALADZE, N.T., Nekotor. zadachi raspoznavaniya obrazov i teorii grafov, Tbilisi, Metsniyereba Press, 1972, pp 18-30

When the installments of all parameters $P_j \in P$ are established, the parameters themselves are estimated for solution of the problem of identification of the objects. In order to make the decision of identity of objects 0_i and θ_x, the identity installment Φ, i.e., the sum of the installments used in the investigation of all parameters $P_j \in P$, is compared with the limiting installment Φ_0. A method is described for estimating parameters in this sense, i.e., a method of establishment of the installments of parameters in the limiting installment Φ_0.

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KIKVIDZE, Z. A., TKEMALADZE, N. T., CHAVCHANIDZE, V. V.

"Methods of Delineation of a Pattern by Means of Computers"

Nekotor. zadachi raspoznavaniya obrazov i teorii grafov [Some Problems from Patter Recognition and Graph Theory -- Collection of Works], Tbilisi, Metsniyereba Press, 1972, pp 49-56 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V695 by V. Mikheyev)

Translation: Methods of solution of the following problem are studied. Suppose $\theta=\{\theta_i\}$ is a finite set of objects, in which the subdivision into classes of equivalence by condition R is defined. By R we mean similarity, i.e., objects with same nomenclature are considered to be equivalent or to be included in the same class. In this case, θ becomes the union of the intersecting classes $\theta=\bigcup_k S_k$, while the set of such classes is a factor-set in relationship to equivalence R. One and only one element of set θ/R corresponds to each element of set , but not vice versa. For each element $\theta_i \in \theta$, condition R allows us immediately to determine class δ_k, of which

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KIKVIDZE, Z. A., TKEMALADZE, N. T., CHAVCHANIDZE, V. V., Nekotor. zadachi raspoznavaniya obrazov i teorii grafov, Tbilisi, Metsniyereba Press, 1972, pp 49-56

θ_i is a representative, since each object corresponds the class of its nomenclature. Two methods of construction of θ/R by computer are presented.

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UDC 62-50

CHAVCHANIDZE, V. V.

"Self-Organization of Discrete Systems (Bionic Principles of Regeneration and Reduction)"

Moscow, Avtomaty, Gibridnyye i Upravlyayushchiye Mashiny, "Nauka", 1972, pp 167-174

Abstract: In the process of "perception" of natural and artificial signals there must always be an increase in the vector dimensionality of signals which leads to an increase in the sensitivity of the perceiving bionic system to physically distinct segments of the vector signal. In this way a qualitatively separate and quantitatively defined characteristic can be "assigned" to each spatial point of the perceived world, thus "coloring" and quantitatively tagging the perceived world. A quantum theory of signal reception and generation is constructed as a general theory in which the vectors of states and vector signals in reception and generation are treated as matrices whose elements are complex quantities, and only particular bilinear combinations can be interpreted as probabilities. It is shown that the process of regenerational transformation of information sig-

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CHAVCHANIDZE, V. V., Avtomaty, Gibridnyye i Upravlyayushchiye Mashiny, "Nauka", 1972, pp 167-174

nals is widespread. The problem of self-organization is considered from this same standpoint. It is shown that this involves utilization of differences associated with the completion of irreversible processes in the system, which is equivalent to the presence of memory in the system. Hierarchical organization of data reception, as well as generalized reception (an increase in the number of receivers) with simultaneous reinforcement of correlations between receiver-generators under certain conditions, leads to self organization. An analysis is made of the role of the environment and the system of "selection" of exceptional (rare) states for processes leading to a reduction of the entropy of the system.

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USSR

CHAVCHANIDZE, V. V., Corresponding Member of the Georgian Academy of Sciences; VANYAN, A. R.; et al (Georgian Academy of Sciences, Institute of Cybernetics)

"Assessment of Projective Holographic Systems by Comparing the Line Scattering Functions (LSF) of the Corresponding Holographic Images"

Tbilisi, Bulletin of the Academy of Sciences of the Georgian SSR; February 1973, pp 309-312

Abstract: The problem of determining the resolving capacity of projective holographic systems by comparing the line scattering functions of corresponding holographic images is considered. The optimum experimental conditions resulting in high-grade holograms of two-dimensional objects were found. Judging by the experimental results, the half-width of SLF at diffusion illumination (lighting) of the object is 1.4 times greater than at holographing in non-scattered beams. The observed difference is mainly due to interference (noise disturbance) resulting from a coarse-grained scatterer. With a more fine-grain scatterer this difference becomes negligible and therefore both methods can give equal accuracy according to their resolution.

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CHAVCHANIDZE, V. V., Institute of Cybernetics of the Academy of Sciences Georgian SSR, Tbilisi

"Physics of Coherent Processes and Systems (Coherence in Holodynamic Systems)"

Manuscript deposited in VINITI, No. 4448-72 Dep, 20 June 1972, 27 pp, 22 ref. (from RZh-Fizika, No 10, Oct 72, Abstract No 10D748DEP)

Translation: An attempt is made to develop a single scientific concept for a large number of known physical factors and phenomena from optics, holography, coherent optics, UHF technology, the physics of phase transitions, plasma physics, radar technology, radiophysics, and many other fields of physics and engineering. Theoretical physics in the form of relativity theory, quantum mechanics, and quantum field theory has essentially developed a logically complete and conceptual base for considering phenomena and processes occurring in all these fields of physics and technology. It is proposed as a common conceptual beginning permitting one to consider these phenomena and processes from a single viewpoint, the conceptions of collectivity and compatibility of the dynamics of processes occurring in elements of component systems. Demonstrating the generality and universality of the

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CHAVCHANIDZE, V. V., Manuscript deposited in VINITI, No 4448-72 Dep, 20 June 1972, 27 pp, 22 ref. (from RZh-Fizika, No 10, Oct 72, Abstract No 10D748DEP)

principle of coherence for any systems of the world (nonliving and living); for any phenomena; processes of evolution of systems; for any physical manifestations, whether mechanical, optical, or biological, including phenomena of directed activity and thought, is essential in the work. Authors abstract.

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USSR

CHAVCHANIDZE, V. V., V sb. Avtomatv, gibridn. i upravlyayushch. mashiny 1972, pp 167-174

shown that the process of regenerational transformation of information signals is widely propagated in nature. The problem of self-organization is considered from that point of view. It is shown that one must then use the principles connected with the perfection of irreversible processes in the system valent to the presence in the system of memory. The hierarchical organization in the reception of information, and generalized reception (the increase in the number of receivers) with the simultaneous attachment of correlation connections between receiver-generators, lead, under known conditions, to self-organization. The role of the medium and the system of "selection" of exclusive (rare) states for the processes leading to a reduction in the system entropy are analyzed. Bibliography of nine. Author's abstract

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USSR

UDC: 8.74

CHAVCHANIDZE, V. V.

"Self-Organization of Discrete Systems (Biological Principles of Regeneration and Reduction)"

Moscow, V sb. Avtomaty, gibridn. i upravlyayushch. mashiny (Automatons, Hybrid and Control Machines--collection of works) 1972, pp 167-174 (from RZh--Matematika, No 7, 1972, Abstract No 7V656)

Translation: In the process of "perception" of natural and artificial signals, there must always be an increase in the vector dimension of the signals, leading to an improvement in the sensitivity of the perceiving bionic system to the physically differing parts of the vector-signal. This permits each spatial point of the perceived world to be "ascribed" to a qualitatively special and quantitatively definite characteristic by which the perceptible world "is colored" and is quantitatively labeled. A quantum theory of signal reception and generation is constructed as a general theory in which the vectors of the states and the vector of the signals in reception and generation are considered as matrices whose elements are essentially complex quantities, and only their special bilinear combinations can be interpreted as possibilities. It is

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CHAVCHANIDZE, V. V.

UDC 8.74

"Self-organization of Digital Systems. (Bionic Principles of Regeneration and Reduction)"

V sb. Avtomaty, gibridn. i upravlyayushch. mashiny (Automata, Hybrid and Control Machines -- collection of works), Moscow, Nauka Press, 1972, pp 167-174 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V656)

Translation: In the process of "perception" of natural and artificial signals, it is always necessary to augment the vector dimensionality of the signals which leads to an increase in sensitivity of the perceiving bionic system to the physically different sections of the vector signal. This permits each of the spatial points of the perceived world to be assigned a qualitatively special and quantitatively defined characteristic by which the perceived world is "colored" and quantitatively marked. The quantum theory of the reception and generation of signals is constructed as a general theory where the vectors of states and the vector signals for the reception and generation are considered as matrices the elements of which are complex variables and only their special bilinear combinations can be interpreted as probabilities. It is demonstrated that in nature the process of regeneration transformation of information signals is widespread. From this point of view, a study was made of the problem of

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CHAVCHANIDZE, V. V., Avtomaty, gibridn. i upravlyayushch. mashiny, Moscow, Nauka Press, 1972, pp 167-174

self-organization. It is demonstrated that it is necessary to use the principles connected with the completion of irreversible processes in the system which is equivalent to the presence of a memory in the system. The hierarchical organization for information reception and the generalized reception (an increase in the number of receivers) with simultaneous reinforcement of the correlations between the receiving generators under known conditions lead to self-organization. The role of the environment and the system for "sorting" the exceptional (rare) states for the processes leading to reduction of entropy of the system is analyzed. The bibliography has 9 entries.

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USSR

UDC 678.746

VARDOSANIDZE, TS. N., GVATUA, SH. SH., GEORGADZE, YE. Z., KAPANADZE, V. I., MUMLADZE, V. V., KHANEVICHEV, V. A., CHAVCHANIDZE, V. V., Corresponding Member of the Georgian Academy of Sciences SSR, CHAGULOV, V. S., and CHKHIKVISHVILI, L. V., Institute of Cybernetics, Academy of Sciences Georgian SSR

"Several Spectral Characteristics of Polystyrene Activated with Europium Chelate"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 63, No 3, Sep 71, pp 581-584

Abstract: The spectral characteristics of Eu^{3+} chelates have been investigated by a number of authors both in methylmetacrylate and in alcohol solutions. In this article the authors investigate samples of polystyrene doped with 0.02-2 Wt % europium benzoyl acetonate; the samples are 15 mm in diameter and 2 mm thick. They find that such a material exhibits a strong absorption in the region of 3000-4000 Å and the material of the base that is, polystyrene has strong absorption bands in the ultraviolet band of the spectrum; however, it is fully transparent from 3000 Å and up to 1.1μ . The luminescence and absorption spectra are graphically illustrated. The authors find that polystyrene is a successful base for europium benzoyl acetonate. The article contains 3 illustrations and 8 bibliographic entries.

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USSR

UDC: 8.74

CHAVCHANIDZE, V. V.

"Problems of Making Decisions, Formulating Concepts and Heuristic Structurization in Large Systems"

Problemy prinyatiya resheniy, formirovaniya ponyatiy i evristicheskoy strukturizatsii bol'shikh sistem. In-t kibernet. AN GruzSSR (cf. English above. Institute of Cybernetics, Academy of Sciences of the Georgian SSR), Tashkent, 1971, 10 pp, biblio. of 18 titles, No 3949-72 Dep. (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V566 DEP)

Translation: A conceptual description is proposed as a unique, general and universal method for describing systems and structures of arbitrary complexity. It is pointed out that this description, which enables realization of general scientific, general systems, systems analysis, heuristic, and generally cybernetic principles, must at the same time be strictly mathematical, permitting the calculation of concepts corresponding to systems and structures. Therefore it is proposed that a general theory of systems be developed in the form of a general theory of conceptual systems. It is shown that replacing the word "system" by the word "system-concept" is not incidental or formal, for man in fact [deals] objectively with existing systems, i. e. he puts system-objects into correspondence with the system-

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CHAVCHANIDZE, V. V., Problemy prinyatiya resheniy, formirovaniya ponyatiy i evristicheskoy strukturizatsii bol'shikh sistem, Tashkent, 1971, 10 pp

-object or the system-concept by means of which he masters system-objects. The development of a system-concept is the result of observations, experiments, a system of checks and procedures, and practice in general. According to the developing ideology of the general theory of conceptual systems, the procedure of deriving a system-concept is universal, as well as strictly defined, assimilating known logical, statistical, experimental--observational and other methods of collecting and processing information which have been developed by practice and science. It is pointed out that the "technique" of arriving at a concept is in fact that atom of the new approach which enables synthesis of specific program-concepts for given systems. In this connection, the structure of the system-object becomes like the elements of the program-concept, and functioning of the system becomes like transitions and conditional transitions in program-concepts.

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UDC: 8.74

CHAVCHANIDZE, V. V.

"Behavior of Natural and Artificial Control Systems With Isomorphic Conceptual Structures and Models"

Povedeniya upravlyayushchikh yestestvennykh i iskusstvennykh sistem s izomorfnymi ponyatiynymi strukturami i modelyami. In-t kibernet. AN GruzSSR (cf. English above. Institute of Cybernetics, Academy of Sciences of the Georgian SSR), Tashkent, 1971, 9 pp, biblio. of 3 titles, No 3950-72 Dep. (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V582 DEP)

Translation: The paper proposes a conceptual description of complex objects using a system of orthonormalized filters $\{\check{\psi}_1, \check{\psi}_2, \ldots \check{\psi}_n\}$ corresponding to the space of distinctive features, and a system of orthonormalized filters $\{\check{\varphi}_1, \check{\varphi}_2, \ldots, \check{\varphi}_m\}$ corresponding to the space of values. The proposed approach, based on the method of analytical heuristics developed by the author, corresponds neither with logical nor with statistical analysis. It may be assumed that this approach gives a model of perceptive mechanisms of animate organisms, and in this connection it is possible to introduce the idea of the conceptual perceptron. In aspects of the conceptual description, there is the interesting possibility of creation of an "artificial concept", an ag-

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CHAVCHANIDZE, V. V., Povedeniya upravlyayushchikh yestestvennykh sistem s izomorfnymi ponyatiynymi strukturami i modelyami, Tashkent, 1971, 9 pp

gregate constructed on the basis of specific sets of filters $\{\check{\psi}\}$ and $\{\check{\phi}\}$ and amenable to analysis. This makes possible a real approach to creation of an "artificial mind". The conceptual approach is a systems approach. A general theory of systems can be synthesized on the basis of a "conceptual analysis" of structures. Author's abstract.

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UDC: 8.74

CHAVCHANIDZE, V. V.

"Concerning the Question of an Artificial Conceptual Intellect and the Nature of Chess"

K voprosu ob iskusstvennom kontseptual'nom intellekte i o prirode shakhmatnoy igry. In-t kibernet. AN GruzSSR (cf. English above. Institute of Cybernetics, Academy of Sciences of the Georgian SSR), Tbilisi, 1971, 9 pp, bibliography of 7 titles, 3376-71, Dep. (from RZh-Kibernetika, No 4, Apr 72, Abstract No 4V595 DEP)

Translation: Chess is considered from the standpoint of the theory of an artificial conceptual intelligence based on the fact that the positions, states, goals of the game, development of the men, etc. are stated by concept-systems conforming to special laws of behavior. It is shown that new concept-notions may compute and analyze the game in the space of "properties" and in the space of "values." It is shown that an objective procedure based on the method of filtration of initial data enables a unique construction of the vectors of concepts in the form of a normalized disjunctive form of binarized vector-states. Author's abstract.

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USSR

UDC: 530.145

CHAVCHANIDZE, V. V.

"Quantum-Information Switching Functions"

Tbilisi, Soobshch. Akad. Nauk Gruzinskoy SSR, Vol 58, No 2, 1970, pp 297-300

Abstract: The concept of information functions -- functions of algebraic logic allowing, in particular, the thresholds of formal neurons to be considered -- is generalized for quantum-logic deterministic and probability variables, allowing the introduction of quantum-information functions, using the description of quantum mechanics for discrete states. Matrix-analytical representation of states of quantum-logical deterministic and stochastic variables is used. The word "quantum" is understood to refer to the fact that the variables have two components, fixed by sets of discrete quantities with singular numeration. Each state of the input set is set in correspondence with one state of the quantum function.

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CHAVCHANIDZE, V. V.

"The Construction of the General Theory of Systems as a General Theory of Conceptual Systems and Control"

K Postroyeniyu OTS kak Obshchey Teorii Kontsentuyal'nykh Sistem i Upravleniya (OTKSU) [English Version Above], Tbilisi, 1971, 7 pages, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V733 Dep. by the author).

Translation: An attempt is made to find a language allowing a description of an arbitrary system which is homeomorphic or isomorphic to a description of concepts formulated by a natural or artificial intellect. The new approach suggests a conceptual description as the general and universal method for description of systems and structures of any complexity, which means comparison of all objects of systems research to procedurized "computable" concepts, i.e., formation of the corresponding concept structures, concept systems and concept behaviors. Thus, it is suggested that the general theory of systems be replaced with the general theory of conceptual systems. According to the new idealogy, the procedure for production of concept systems is universal, rigidly organized, assimilating known logical,

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CHAVCHANIDZE, V. V., K Postroyeniyu OTS kak Obshch · Teorii Kontsentuyal'nykh Sistem i Upravleniya (OTKSU), Tbilisi, 1971, 7 pages.

statistical, experimental-observational and other methods of collection and processing of information developed by practice and science.

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UDC 681.3.01:681.325.65

CHAVCHANIDZE, V. V., and RUKHADZE, V. A., Institute of Cybernetics, Academy of Sciences Georgian SSR

"A NOT-OR Element"

USSR Author's Certificate No 263207, Filed 10 Oct 68, Published 5 Jan 71 (from Referativnyy Zhurnal -- Avtomatika, Telemekhanika, i Vychislitel'naya Tekhnika, No 8, 1971, Abstract No 8B145 P)

Translation: There are well-known inverting NOT-OR elements for processing information presented in the form of optical pictures; they contain an image converter and an optical system for projecting the pictures on the input of the converter. The NOT-OR element suggested here differs in that it has an inverting packet, which is in the form of a mosaic photocathode covered with a photoconductive layer and a semitransparent silver layer. The latter consists of a silver coating, pieces of cesium, and a current-carrying material. The packet is located at the input of the image converter, which is made in the form of a focusing coil which has embedded inside its cylindrical shell an illuminator and a layer of an electrical phosphor covered with a semitransparent silver coating. This makes it possible to simplify the element.

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UDC 681.325.54

CHAVCHANIDZE, V. V., KAKICHASHVILI, Sh. D., DZHAGAROV, Yu. A., CHIKVAIDZE, D. V., LESELIDZE, D. V., CHRAKADZE, M. I., TEVDORASHVILI, K. G., and LOBZHANIDZE, V. V.

"Optical Signal Adder"

USSR Author's Certificate No 269606, filed 27 Jan 69, published 28 Jul 70 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 6, Jun 71, Abstract No 6 B185 P)

Translation: An optical signal adder for signals given in the form of pictures of rectangular shape is introduced. The adder contains an optical interferometer. It is distinguished by the fact that in order to improve the light efficiency and insure addition with respect to any modulus, the expanding system for conversion of the light pictures to a quadratic matrix is located at its input, after which along the channels corresponding to the components there are a Dove prism and a system of rhombic prisms with sequentially decreasing height the number of which per unit is less than the summation modulus. At the output of the indicated channels there is an interference mixer followed by the compressing system.

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USSR

UDC 681.332.65

CHAVCHANIDZE, V. V., BRODZELI, M. I., KERTSMAN, E. L., GORBUSHINA, L. P., and MALKIN, Ya. P.

"Electrooptical Trigger with Calculating Input"

USSR Author's Certificate No 277844, filed 20 May 69, published 3 Nov 70 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 6, Jun 71, Abstract No 6 B210 P)

Translation: Electrooptical flip-flops based on optron-type polycrystals are well known. In particular, they can consist of a light radiator -- an electroluminescent capacitor -- and a photoreceiver -- a photoresistor. The basic principle on which polycrystalline electrooptical elements are built consists in realizing local optical coupling between the radiator and the photoresistor inside the optron and electrical coupling between the elementary cells. The proposed flip-flop is distinguished by the fact that in it two series-connected photoresistors are connected parallel to the electroluminescent cell connected in series to one of the photoresistors and coupled optically with it. One of the photoresistors is also optically connected to the electroluminescent cell, and the other, jointly with the first resistor, is connected to the input optical signal source. This permits an increase in operating stability of the system.

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CHAVCHANIDZE, V. V., Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 60, No 1, Oct 70, pp 49-52

The H-neuron determines a situation as the reaction of an ordinary c-neuron (classical neuron). The oscillating nature of the dynamic algebraic logical variables involved permits a search for those events during which the oscillations will be absent, and the H-neuron will behave as a c-formal neuron. The H-neuron, under proper circumstances, will be able to "recall" and "predict."

Mixed S-neurons exist in which, in addition to pairs ("q" and "q^{+}"), the axons of other q-neurons end, forming a mixture of ordinary "q" and "H" types of paired neurons.

A signal from the q-neuron can "restore" the original "classical" value fixed by the H-neuron in the form of a "de-excited" wave signal or in the form of reconstructed and conjugate wave signals. R-neurons (reconeurons) play the role of the structure of what was stored by the H-neuron.

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CHAVCHANIDZE, V. V., Soobshcheniye Akademii Nauk Gruzinskoy SSR, Vol 60, No 1, Oct 70, pp 49-52

Obviously, real neurons can exist which incorporate both types of transformation. Mixed neurons will be described functionally as holocorrelating neurons. The existence of inverse-transformational c-to-q neurons is a logical necessity.

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USSR

UDC 153.7

CHAVCHANIDZE, V. V., corresponding member of the Georgian Academy of Sciences

"An Analytical Solution to the Problems of Concept Formation and Pattern Recognition"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 61, No 1, 1971, pp 37-40

Abstract: Let S, a structure characterized by a set A of criteria, be given and let each criterion A_j assume a set of values B. The ordered set of values which are assumed by the criteria $A_1, A_2, \ldots, A_m$ in the process of observing the structure S is called a series of observations (trajectories). For each series the outcome (an evaluation by subjective conformity) of the observed structure is compared to its classification, its concept, and its pattern in the form of conformity or nonconformity. To help solve the problem, the concept of an algebraized set is introduced and the algebra of such a set is explained. Next, coded numerical sets and algebraized sets, which replace the original sets A and B, are introduced. A matrix whose constituents are derived from the series of observations mentioned above is set up, and two disjunctive forms are obtained from the matrix. If all observations are correct, all outcomes correctly recorded, and all

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CHAVCHANIDZE, V. V., Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 61, No 1, 1971, pp 37-40

criteria and values assigned to the appropriate sets of criteria and algebraized sets of values, then the disjunctive forms will contain all the necessary and sufficient information included in the series of observations, and this representation will be a nontrivial and exhaustive description of the experience which has been accumulated.

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USSR UDC: 51:155.001.57:681.3.06.001

CHAVCHANIDZE, V. V.

"Self-Organization of Discrete Systems"

Samoorganizatsiya diskretnykh sistem. In-t kibernet. AN GruzSSR (cf. English above. Institute of Cybernetics, Academy of Sciences of the Georgian SSR), Tbilisi, 1970, 35 pp, ill, bibliography of 26 titles (No 2081-70 Dep.) (from RZh-Kibernetika, No 1, Jan 71, Abstract No 1V645 Dep.)

Translation: A study of the nature and fundamental structure of sensory organs (receivers of external information) shows that amplification of the dimensionality of the space of states takes place in all cases in the process of signal perception. In this sense, the validity of a number of bionic principles is confirmed. A corresponding quantum theory is constructed for reception and emission of n-component signals as a general theory where the states of the vector signals during reception and emission are treated as n-component matrices whose elements are complex quantities, and only particular bilinear combinations of these elements may be interpreted as probabilities. The corresponding mathematical apparatus is outlined as adapted to the needs of the given model. The problem of self-organization is considered from the developed viewpoint. It is shown that it is necessary to enlist other principles involving the completion of irreversible processes,

CHAVCHANIDZE, V. V. Samoorganizatsiya diskretnykh sistem. In-t kibernet. AN GruzSSR, Tbilisi, 1970

which is equivalent to the presence of memory in the system. Hierarchical organization in the reception of information, and generalized reception (an increase in the number of receivers) with simultaneous reinforced correlation connections between the receiver-emitters under certain conditions lead to self-organization. Author's abstract.

2/2

USSR UDC: 51:155.001.57:518.9

CHAVCHANIDZE, V. V.

"Analytical Heuristics of an Aritficial Intellect in Formulating Concepts, Recognizing Patterns and Classifying Objects"

Analiticheskiye evristiki iskusstvennogo intellekta pri formirovanii ponyatiy, opoznavanii obrazov i klassifikatsii ob"yektov. In-t kibernet. AN GruzSSR (cf. English above. Institute of Cybernetics, Academy of Sciences of the Georgian SSR), Tbilisi, 1970, 20 pp, ill., bibliography of 14 titles, No 2080-70 Dep. (from RZh-Kibernetika, No 1, Jan 71, Abstract No 1V657 Dep.)

Translation: A method of analytical-matrix representation of logic functions by discrete orthonormalized basis vector-matrices previously developed by the author is taken together with generalization of the concept of entry of an element into algebraicized sets ("al-sets") as a basis for correctly formulating a procedure for analytic search which generalizes data of series observations of the "value — characteristic — outcome" type. The problem reduces to minimization of the disjunctive normal form. The effectiveness of the method is demonstrated as well as the possibility of extracting data on those "values" which are critical for given "outcomes." Author's abstract.

1/1

USSR UDC: 519.95

CHAVCHANIDZE, V. V., corresponding member of the Georgian Academy of Sciences, Institute of Cybernetics of the Georgian Academy of Sciences

"On a Theory of Quantum-Wave Automata"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 59, No 2, Aug 70, pp 305-308

Abstract: By choosing a structural approach to the development of classical and quantum logic, which does not depend upon the generally accepted axiomatic method, and by using his previously developed matrix-analytical method of representing algebraic-logical information functions, the author is able to represent each classical automaton in a compact and analytical form and to write the equation of the quantum automaton that corresponds to it. In contrast to the classical theory of automata, a classical automaton is given in matrix-analytical form and can be designated by a description of its inputs $\{x_1, x_2, \ldots, x_{m_x}\}$, outputs $\{z_1, z_2, \ldots, z_s\}$, and internal states $\{q_1, q_2, \ldots, q_{m_q}\}$ with the aid of the basis vector-matrices of the states of the appropriate ranks. In canonical form, a classical automaton is given by

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CHAVCHANIDZE, V. V., Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 59, No 2, Aug 70, pp 305-308

$$\overset{V}{\Psi}_z(t) = F_1[\overset{V}{\Psi}_x(t), \overset{V}{\Psi}_q(t)], \quad (1)$$

$$\overset{V}{\Psi}_q(t+1) = F_2[\overset{V}{\Psi}_x(t), \overset{V}{\Psi}_q(t)],$$

where $F_1[\overset{V}{\Psi}_k, \overset{V}{\Psi}_g]$ and $F_2[\overset{V}{\Psi}_x, \overset{V}{\Psi}_g]$ are single-valued logic functions of the arguments -- the basis vector-matrices $\overset{V}{\Psi}_x$ and $\overset{V}{\Psi}_g$ and the vector-matrix $\overset{V}{\Psi}_z$ ($m = m_x + m_q$, where m_x and m_q are the number of independent input and internal variables in conformity with the ordinary representation of the automata); the rank of $\overset{V}{\Psi}_z$ is equal to 2^m, where $2^m = k$ and $k \geqslant 2^s$. The author examines equations (1) and (2) for a case cited in one of his previous works and derives the corresponding equations or tables for transferring the ordinary automata given in canonical form to the new types of automata by substituting the alphabetic pair $\{a, \bar{a}\}$ for the pair $\{1, 0\}$. He also discusses briefly the application of his principles to some other examples.

2/2

USSR

UDC 621.373.029.67.001.5

GAPRINDASHVILI, KH. I., KUKHARSKIY, R. N., LEBEDEVA, YE. A., LEZHAVA, B. S., MUMLADZE, V. V., CHAVCHANIDZE, V. V.

"Coupled Filament Lasers"

Moscow, Radiotekhnika i Elektronika, Vol 15, No 7, 1970, pp 1457-1460

Abstract: Experimental results are presented for the conversion of energy from one passive light conductor to another at a small distance from the first. The minimum length of contact required for maximum transfer of the radiation is determined. The effect of the transfer is used for mutual decrease in the radiation of two-filament lasers (quenching). The case in which a one-filament laser quenches two adjacent ones is investigated.

The possibility of an effect of a one-filament laser on several is also investigated. Experiments performed with three-filament lasers demonstrated that the radiation jumps from one filament to the other two and decreases their radiation intensity.

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USSR

GAPRINDASHVILI, KH. I., et al, Radiotekhnika i Elektronika, Vol 15, No 7, 1970, pp 1457-1460

The experimental results are presented in a table including a case in which laser I extinguished lasers II and III. The maximum extinguishing coefficients obtained for two- and three-filament lasers turn out to be identical and equal to 0.50-0.65. The extinguishing coefficient depends on the radiation energy of the extinguishing laser and increases with an increase in it, for the cases of both two and three filaments.

2/2

Acc. Nr: AP0034407 Ref. Code: UR 0297

PRIMARY SOURCE: Antibiotiki, 1970, Vol 15, Nr 2, pp 112-116

COMBINED USE OF SEMI-SYNCHETIC PENICILLINS IN EXPERIMENTS

Petrova, M. A.; Berezina, Ye. K.; Chavdarova, V. B.; Navashin, S. M.

National Institute for Antibiotics, Moscow

The efficacy of ampicillin combination with oxacillin was estimated on a model of mixed infection caused by intravenous injection of B. coli and intranasal administration of Staph. ablus.

D.n.

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REEL/FRAME
19711067

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USSR

UDC 621.762.002.5(088.8)

MEL'NIKOV, V. N., TRET'YAKOV, V. I., YEMEL'YANOVA, M. D., MUKHAMEDZHANOV, A. K., KAMENSKAYA, D. S., MORGUN, G. N., CHAVRIKOV, M. G., and GRACHEV, Yu. S.

"Rotating Electrical Furnace for Production of Metallic Powders"

USSR Author's Certificate No 267823, Filed 23/06/66, Published 23/07/70 (Translated from Referativnyy Zhurnal-Metallurgiya, No 2, 1971, Abstract No 2 G477 P)

Translation: The furnace includes a hopper, loading and unloading chambers with worms, a body, rotating tube, and a device for removal of the layer of powder accumulating on the surface of the tube. In order to increase productivity of the process and improve working conditions, the device for removal of the powder layer from the surface of the tube is firmly fastened in the working space of the tube so that its leading edge is located parallel to its axis and its working face is at an angle to the radius. The device is attached to parts of the loading and unloading chambers.

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1/2 014 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--FLARE STARS IN THE PLEIADES -U-

AUTHOR-(05)-AMBARTSUMIAN, V.A., MIRZOIAN, L.V., PARSAMIAN, E.S., CHAVUSHIAN, O.S., YERASTOVA, L.K.

COUNTRY OF INFO--USSR

SOURCE--ASTROFIZIKA, VOL. 6, FEB. 1970, P. 1-30

DATE PUBLISHED----FEB70

SUBJECT AREAS--ASTRONOMY,ASTROPHYSICS

TOPIC TAGS--STAR, ASTRONOMIC OBSERVATORY, FLARE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1770 STEP NO--UR/0388/70/006/000/0007/0030

CIRC ACCESSION NO--AP0125386

UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0125386

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. OBSERVATIONAL DATA FOR 46 NEW FLARE STARS DISCOVERED IN THE PLEIADES DURING 1968 AND 1969 AT THE TONANTZINTLA, ASIAGO, BIURAKAN, BUDAPEST, AND ALMA ATA OBSERVATORIES. A STATISTICAL STUDY OF FLARE STARS SHOWS THAT THEIR OVERALL NUMBER IN THE PLEIADES SHOULD EXCEED 600. THE DISTRIBUTION OF FLARE STARS ACCORDING TO THE NUMBER OF OBSERVED FLARES IS WELL REPRESENTED BY THE SUM OF TWO POISSON DISTRIBUTIONS WITH DIFFERENT MEAN FREQUENCIES. ALL, OR ALMOST ALL, OF THE MEMBERS IN PLEIADES WITH VISUAL MAGNITUDES LESS THAN 13.3 ARE FLARE STARS. AT A VALUE OF 13.29, THERE IS A SHARP BORDER BETWEEN PHOTOGRAPHICALLY OBSERVABLE FLARE STARS AND NONFLARING STARS. THE MEAN FREQUENCY OF LARGE FLARES (AMPLITUDE GREATER THAN 0.6 MAGNITUDE) WAS .0001 PER HR FOR MOST STARS. FACILITY: BIURAKANSKAIA ASTROFIZICHESKAIA OBSERVATORIIA, YEREVAN, ARMENIAN SSR.

UNCLASSIFIED

1/3 010 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--EVALUATIONS OF THE MEAN AGES OF O-B5 STARS BASED ON THEIR DISTRIBUTION IN STELLAR ASSOCIATIONS -U-
AUTHOR-(03)-MIRZOYAN, L.V., KAZARYAN, E.S., CHAVUSHYAN, O.S.

COUNTRY OF INFO--USSR

SOURCE--SOOVSHCHENIYA BYURAKANSKOY OBSERVATORII AKADEMIYA NAUK ARMAYNSKOY SSR, 1970, NR 41, PP 69-79
DATE PUBLISHED--------70

SUBJECT AREAS--ASTRONOMY,ASTROPHYSICS

TOPIC TAGS--STAR, STELLAR EVOLUTION, FIRST APPROXIMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1994/0370 STEP NO--UR/2620/70/000/041/0069/0079

CIRC ACCESSION NO--AP0114660
UNCLASSIFIED

2/3 010 UNCLASSIFIED PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0114660

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ON THE BASIS OF THE OBSERVATIONAL MATERIAL (TABLE 1) THE SPACE DISTRIBUTIONS OF O-B0, B0.5-B1, B1.5-B2 AND B2.5-B5 STARS IN THE SYNTHETIC STELLAR ASSOCIATION (TABLE 2) HAVE BEEN DETERMINED. BY MEANS OF THE OBTAINED DATA TAKEN WITH THE "HYPERBOLIC" APPROXIMATION (1) (TABLE 3) THE MEAN AGES OF THE STARS FOR EACH OF THE MENTIONED INTERVALS OF SPECTRAL TYPES HAVE BEEN EVALUATED. IT HAS BEEN SUPPOSED THAT ALL STARS HAVE BEEN EJECTED FROM THE NUCLEI OF THE EXPANDING STELLAR ASSOCIATIONS AND THAT THE SYNTHETIC ASSOCIATION REGARDING TO THE PHENOMENON OF STELLAR FORMATION IS IN A STATIONARY STATE. THE STELLAR AGEING FUNCTION F (R) (16) IS USED, WHICH ACTUALLY PRESENTS THE DEPENDENCE OF THE FLOW OF EXPANDING STARS OF A GIVEN SPECTRAL TYPE FROM THE DISTANCE (2) AND DETERMINES THEIR AGING RATES. TAKING INTO ACCOUNT THAT, ACCORDING TO THE OBSERVATIONAL DATA, THE PROCESS OF O-B STARS AGING HAS, IN A FIRST APPROXIMATION, THE PROPERTIES OF A STATISTICAL PROCESS (3, 16), F (R) IS PRESENTED BY AN EXPONENTIAL FUNCTION (3). IF THE VELOCITY OF EXPANSION IN THE ASSOCIATION IS CONSTANT, THEN THE DETERMINATION OF THE SLOPE OF THE LINEAR RELATION (LG F (R), R) (FIG. 2), OBTAINED ON THE BASIS OF THE OBSERVATIONAL DATA, IS EQUIVALENT TO THE EVALUATION OF THE MEAN AGES OF STARS. IN FACT THE MEAN VILOCITY OF EXPANSION INCREASES WITH THE DISTANCE FROM THE CENTRE OF THE SYNTHETIC ASSOCIATION. THE EVALUATIONS OF O-B5 STARS AGES FOR TWO CASES, OF A CONSTANT VELOCITY OF EXPANSION (K EQUALS 1) AND OF A VELOCITY, INCREASING LINEARLY WITH THE DISTANCE (K EQUALS 2), ARE PRESENTED (TABLE 2).

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3/3 010 UNCLASSIFIED PROCESSING DATE--09OCT70
CIRC ACCESSION NO--AP0114660
ABSTRACT/EXTRACT--THE OBSERVED DEPENDENCE OF THE MEAN AGES OF O-B5 STARS FROM THE SPECTRAL TYPE (FIG. 3) CORRESPONDS TO THE KNOWN EVALUATIONS OF AGES OBTAINED BY OTHER METHODS AND TESTIFIES THE VALIDITY OF THE USED METHOD.

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CHAPTER 3

DETERMINATION OF THE TRANSPARENCY OF THE ATMOSPHERE

Usually for measurement of the transparency of the atmosphere or the meteorological visibility associated with it systems are used which consist of a light source and a receiver, located at opposite ends of the optical path. The distance separating the radiation source from the receiver is fixed according to the limit of visibility for the poorest atmospheric conditions. This does not make it possible for one instrument to record the transparency of the atmosphere in long tracks. Another shortcoming of such systems is the possibility of practical measurements only on horizontal tracks.

The development of laser locators determining the transparency of the atmosphere and the development of the corresponding methods of measurements, make it possible to perform measurements on any track. An advantage of laser systems also is the possibility of the determination of the visibility at quite long distances and the recording of the variation of the transparency of the atmosphere with a high degree of spatial resolution.

The basic difficulty in the determination of transparency by the method of optical location lies in the correct selection of the forward scattering indicatrix in each specific case and in consideration of multiple scattering in sounding of optically dense media.

In references [24--26] for various models of mists and fogs calculated data of the intensity of forward scattered radiation are given. The calculations of the intensity of light scattered ahead once in the irradiation of fogs by a narrow light beam were performed by V. K. Kozlov and Ye. O. Fedorova [27]. K. S. Shifrin and I. L. Zel'manovich calculated in detail the quantities necessary for the determination of the forward scattering factor [28].

Experimental investigations of forward scattered radiation of an OKG, generated on various wavelengths, were performed in artificial fogs and smokes, and also in natural conditions in mists and snowfalls [29, 30]. These measurements made it possible to obtain certain preliminary estimates of the magnitude of reverse scattering.

Information concerning the transparency of the medium is also contained in the variation of the form of a short laser pulse in its propagation in the medium. This phenomenon was observed in natural fogs, where the increase in the attenuation factor from 10^{-2} to 10^{-2} m^{-1} changed the duration of the pulse arriving at the lidar receiver from 2.5 to 0.5 microseconds [31].

In experiments performed at the IOA of the Siberian Division of the USSR Academy of Sciences [32] it was established that with a decrease in the optical density of the medium the duration of the forward front of a reflected pulse increases, and the steepness of its drops. As a radiation source, a semiconductor OKG of gallium arsenide (wavelength 8400 Angstrom units) with a radiated pulse duration of 8 nanoseconds was used. In scattering in artificial water fogs and in smokes, the reflected pulse duration decreases with an increase in the attenuation factor and tends toward the duration of the radiated pulse. This is explained by the fact that with a decrease in the transparency of the medium the length of the layers in which the reflected signal is formed dropped. It was also established that the difference in the scattering indicatrices of the media has an essential effect on the formation of the signal. A pulse reflected in fogs is formed in layers more distant from the OKG than in smokes.

The results of the measurements of the form (shape) of the pulse performed agree well with the calculations obtained in the use of the Monte-Carlo method [33].

The deformation of the pulse of the OKG in the scattering medium makes it possible to use this effect for realization of a lidar intended for the measurement of the meteorological range of visibility. Such a lidar, patented in France [34], must determine the visibility at airports. In the system, measurements of the time of appearance of the maximum intensity of a forward scattered signal in comparison with a radiated signal is provided, as well as measurement of the duration of an arriving pulse at a level of 0.5 from the maximum, and the steepness of the rear front of the pulse.

Another method of measuring the transparency of the atmosphere with a laser locator proposed by Yu. G. Shvidkovskiy and his co-workers [20] has, briefly, in the following.

Laser radiation scattered in the nearby zone is recorded on a receiving system. By measuring the radiated power and the power arriving at the lidar receiver as a function of distance, we can, according to formulas (2.2) or (2.4), calculate the scattering factor of the atmosphere associated with the meteorological visibility. The method is absolute and does not require measurement of the profile of the arrested pulse. The shortcoming of the method lies in the quite complex laboratory calibration of the apparatus for the performance of measurement with a good accuracy.

The scattering factor measured by a lidar is the sum of the aerosol and molecular scattering factors. The molecular scattering factor may be calculated for any altitude, if the density of the air is known, and the aerosol factor determined accordingly. On the other hand, the aerosol scattering factor may be calculated at a certain previously assigned distribution of the particles by dimensions, the refraction factor of the particles, and their concentration. In accordance with the calculations performed by K. S. Shifrin and [illegible] A. Chayanova [35, 36] for a known function of the distribution of particles by dimensions and a refraction factor of the particles of 1.5, in reference [20] according to data from lidar determination of the transparency of the atmosphere for various conditions, the concentrations of aerosol particles were calculated. The results of the calculations agree well with the data obtained by other methods.

The measurement of the transparency of the atmosphere with a laser locator makes it possible to study the pollution of the atmospheric air and to determine the spatial distributions of the pollutants. For example, in reference [37] the results of the determination of the turbidity factor, visibility, and the profile of the concentration of the particles polluting the air are given.

An increase in the potential of a laser locator gives the opportunity to record a signal arriving from the upper atmosphere. This makes it possible to investigate the transparency of the high layers of the atmosphere. At the same time, the signal being recorded carries information concerning the thermodynamic characteristics, and in certain cases also concerning the composition of the atmosphere.

1/2 048 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--POSSIBILITY OF STUDYING THE COMPOSITION OF THE UPPER ATMOSPHERE WITH THE AID OF RESONANCE SCATTERING EFFECTS -U-

AUTHOR-(03)-SHVIDKOVSKIY, YE.G., KOSTKO, O.K., CHAYANOVA, E.A.

COUNTRY OF INFO--USSR

SOURCE--KOSMICHESKIE ISSLEDOVANIIA, VOL. 8, MAR.-APR. 1970, P. 310, 311

DATE PUBLISHED--------70

SUBJECT AREAS--ATMOSPHERIC SCIENCES, PHYSICS

TOPIC TAGS--UPPER ATMOSPHERE, RESONANCE SCATTERING, LASER RADIATION, ATMOSPHERE COMPOSITION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/1761 STEP NO--UR/0293/70/008/000/0310/0311

CIRC ACCESSION NO--AP0115590

UNCLASSIFIED

2/2 048 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0115590
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSIDERATION OF THE POSSIBILITY OF USING RESONANCE BACKSCATTERING OF LASER RADIATION PROPAGATING THROUGH THE EARTH'S ATMOSPHERE AS A MEANS OF STUDYING THE COMPOSITION OF THE UPPER ATMOSPHERE. ON THE BASIS OF AN ANALYSIS OF THE RADIATIVE TRANSITIONS CHARACTERISTIC OF CERTAIN STATES OF NITROGEN MOLECULES, IT IS SHOWN THAT THIS BACKSCATTERING EFFECT, ALTHOUGH HARMFUL FOR PURPOSES OF COMMUNICATION AND INFORMATION TRANSMISSION, IS USEFUL FOR STUDYING THE FINE STRUCTURE OF THE COMPOSITION OF THE ATMOSPHERE. AN ESTIMATE IS MADE OF THE EFFECT OF RESONANCE BACKSCATTERING DUE TO ABSORBING NITROGEN MOLECULES AND IONS IN THE EARTH'S ATMOSPHERE ON THE ENERGY ENTERING THE RECEIVER OF AN OPTICAL RADAR.

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002200520013-6"

USSR

UDC 621.373.826:550.3

GERMAN, A. I., SHULYAKOVSKIY, G. Ye., CHAYANOVA, E. A., GULYAYEV, G. A., ZHURAVLEV, V. F., ZAKATOVA, T. M., and KNYAZ'KIN, V. V.

"Investigating the Effect of the Atmosphere on the Propagation of Coherent Radiation With the Wavelength of λ = 10.6 Microns"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses--collection of works) "Nauka," 1972, pp 179-183 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10D381)

Translation: Results are given of experiments on the determination of the coefficient of attenuation in coherent measurements (wave of 10.6 microns) as it passes over the uniform ground surface in a range of about 8 km. The radiation source was a stabilized laser on an OKG-15 base, operating in single mode with an output power of 1.2-1.5 W. The radiation was modulated with a 1080 Hz frequency. A diagram of the relative angular distribution of the radiation was given, which permitted the divergence angle of the radiation and the zone of maximum signal level to be determined. All

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GERMAN, A. I., et al., V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl., "Nauka," 1972, pp 179-183

further measurements were made in this zone. The value of the attenuation factor is within the limits of 0.03-0.08 km^{-1} for clear weather, in the interval of 0.08-0.2 km^{-1} for light fog and drizzles, and in the range of 0.5-0.6 km for heavy downpours. The proposed method for relative measurements of the attenuation factor gives a measurement error one-half that obtained in the absolute method.

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USSR

UDC 612.883.81 + 613.648

KHARCHENKO, P. D., CHAYCHANKO, G. M., and ELMURATOV, S., Chair of the Human and Animal Physiology, State University Kiev

"Effect of X-ray Irradiation on the Conditioned Motor Reflex Activity of Young Rats"

Kiev, Fiziolohichnyy Zhurnal, Vol 19, No 4, Jul/Aug 73, pp 441-448

Translation: Irradiation of young rats -- 3-4 months old -- with x-rays in doses of 500, 600, and 700 r leads to a disturbance of their conditioned reflex activity manifested by increased latent period and duration of the reflex, as well as in the number and magnitude of the interval reactions. At higher doses (600 and 700 r) these changes have a dual phase character: immediately after the exposure (1-7 days) and after a period of relative stabilization (18-24 days). The irradiation leads also to a dual phase lowering of the general activity of animals: on 5-7th and 18-24th days. The radiation effect is exhibited principally by a marked diminution of the inhibition process, which appears both early (4-7 days) and about 2-3 weeks after irradiation.

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USSR

UDC 632.95

KHOKHLOV, P. S., SAVENKOV, N. F., BLIZNYUK, N. K., CHAYEVA, T. I., All-Union Scientific Research Institute of Phytopathology, Moscow, Ministry of Agriculture USSR

"Method of Obtaining Amides of Dialkylphosphoric Acid"

USSR Author's Certificate No 248659, Cl. 12o, 16 (C 07c), filed 4 Mar 68, published 26 Feb 70 (from RZh-Khimiya, No 19 (II), 10 Oct 70, Abstract No 19 N576P by L. V. RAZVODOVSKAYA)

Translation: Compounds of the formula $RC(O)CH=CHNHP(O)(OR')_2$ (I), where R = alkyl, aryl, R' = alkyl, are obtained by the interaction of $RC(O)CH=CHNH_2$ (II) with $ClP(O)(OR')_2$ (III) in the presence of Et_3N. To a solution of 0.02 mole II (R = 4-ClC_6H_4) and 0.02 mole Et_3N in 20 ml benzene, 0.02 mole III (R' = Et) in 5 ml benzene is added, heated 4 hours at 75-80°, and filtered, the filtrate is evaporated, and I (R = 4-ClC_6H_4, R' = Et) is obtained, yield 85.2%, melting point 172-4°. Analogously obtained are the following I (shown are R, R', yield, melting point): 4-ClC_6H_4, Bu, 86.3, 179-80; 4-BrC_6H_4, Bu, 55.7, 207-9 and I (R = H, R' = Et), yield 94, $n^{20}D$ 1.4882, d_4^{20} 1.1562. I can be employed as pesticides.

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1/2 015 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--TACHYPHYLACTIC PROPERTIES OF SOME ANGIOTENSIN II ANALOGS -U-

AUTHOR-(02)-LIYELAYS, YA.P., CHAYEVSKAYA, YE.M.

COUNTRY OF INFO--USSR

SOURCE--FARMAKOL. TOKSIKOL. (MOSCOW) 1970

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--VASODILATOR, CARDIOVASCULAR DRUG, SYNERGY, DRUG DOSAGE RESPONSE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1986/1672 STEP NO--UR/0390/70/033/001/0051/0053

CIRC ACCESSION NO--AP0103438

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0103438

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ALPHA,ASPARAGINYL PRIME1,VALYL PRIME5,ANGIOTENSIN II EXHIBITED CROSS TACHYPHYLAXIA IN NEPHRECTOMIZED RATS WITH BOTH BETA,ASPL PRIME1,VALYL PRIME5,ANGIOTENSIN II AND SUCCINYL PRIME1,VALYL PRIME5,ANGIOTENSIN II. REPEATED ADMININSTRATION OF LARGE ALPHA,ASPARAGINYL PRIME1, VALYL PRIME5, ANGIOTENSIN II DOSES (10 MUG) INDUCED TACHYPHYLACTIC RESPONSES; BETA,ASPARTYL PRIME1,VALYL PRIME5,ANGIOTENSIN II HAD THE SAME EFFECT, NOT ONLY IN LARGE DOSES, BUT ALSO WITH 0.1 MUG FOLLOWING 10 MUG. FACILITY: LAB. FARMAKOL., INST. ORG. SINT., RIGA, USSR.

UNCLASSIFIED

USSR UDC 620.172:193.57

POPOVICH, V. V., BICHUYA, A. L., ZAMORA, M. F., MIZETSKIY, V. L., SHIL'NIKOVA, G. K., BEREZHKO, B. I., and CHAYEVSKIY, M. I., Institute of Physico Mechanics, Academy of Sciences, UkrSSR, L'vov; L'vov Polytechnical Institute

"Influence of Smelting Method on the Physical and Mechanical Properties of 15KhS1MFB Steel"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 6, No 6, 1970, pp 93-97

Abstract: The corrosion resistance and long-term strength of ordinary and vacuum-smelted 15KhS1MFB steel were studied in a fused lead-bizmuth eutectic. The changes in microstructure, microhardness, coercive force, and electrical resistance of specimens tested for corrosion and long-term strength were studied. It is demonstrated that 15KhS1MFB steel, regardless of the method of smelting, is little influenced by the eutectic Pb-Bi alloy at 470-550°C. The vacuum-smelted steel has practically the same long-term strength as the ordinary steel, but somewhat better plasticity.

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1/2 036 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--ROLE OF STRESSES IN ACCELERATING THE PENETRATION OF MOLTEN METALS INTO SOLID METALS -U-

AUTHOR--CHAYEVSKIY, M.I., TOROPOVSKAYA, I.N., POPOVICH, V.V., DATSISHIN, A.M.

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. MEKH. MATER. 1970, 5(6), 692-698

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--LIQUID METAL, ZINC, COPPER, BISMUTH, LITHIUM, IRON, METAL STRESS, INTERNAL STRESS, METAL SURFACE IMPRENATION, PLASTIC DEFORMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0625 STEP NO--UR/0369/70/005/006/0692/0698

CIRC ACCESSION NO--AP0105604

UNCLASSIFIED

2/2 036 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0105604

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF APPLIED STRESSES ON THE RATE AT WHICH MOLTEN METAL PENETRATES SOLID METAL DEPENDS ON THE INTERACTION OF THE METALS WHICH IN TURN IS DETD. BY THEIR STRUCTURE. REGULAR DIFFUSION OF MOLTEN INTO SOLID METALS IS LEAST AFFECTED BY STRESSES OF PLASTIC DEFORMATION. IT FOLLOWS THAT ACCELERATION OF DIFFUSION IS LEAST WHEN THE 2 METALS FORM SOLID SOLNS. OR INTERMETALLIC COMPDS. WHEN THIS IS NOT THE CASE APPLIED STRESSES WILL ENHANCE DIFFUSION. THESE CONTENTIONS WERE TESTED BY EXPTS. ON THE DIFFUSION OF MOLTEN ZN INTO CU, MOLTEN BI INTO CU, AND MOLTEN LI INTO ARMCO FE.

UNCLASSIFIED

1/2 048 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--CORROSION RESISTANCE OF MOLYBDENUM COATINGS PREPARED BY CONTACT MELTING -U-

AUTHOR--UELSKIY, A.A., BICHUYA, A.L., GARASIM, YU.A., CHAYEVSKIY, M.I.

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. MEKH. MATER. 1970, 5(6), 704-8

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--CORROSION RESISTANCE, MOLYBDENUM, METAL COATING, HYDROCHLORIC ACID, ALLOY DESIGNATION, NICKEL ALLOY, NITRIC ACID, SULFURIC ACID, TITANIUM STEEL, CHROMIUM NICKEL STEEL, LEAD ALLOY, BISMUTH ALLOY, EUTECTIC/(U)EI437B NICKEL ALLOY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0623 STEP NO--UR/0369/70/005/006/0704/0709

CIRC ACCESSION NO--AP0105602

UNCLASSIFIED

2/2 048 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0105602

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESISTANCE TO CORROSION AND FATIGUE OF A CR-NI-TI STEEL AND OF ALLOY EI 437B WAS IMPROVED BY A MO COATING APPLIED BY CONTACT MELTING. THE CORROSION RESISTANCE OF THE STEEL WAS TESTED IN 10PERCENT HCL AND IN 80PERCENT H SUB2 SO SUB4. TWO KINDS OF MO COATED SPECIMENS WERE TESTED, ONE OBTAINED BY DIFFUSION METHOD AND THE OTHER BY MELTING. IN THE CORROSIVE SOLN. THE SPECIMENS COATED WITH MO BY EITHER METHOD WAS MORE RESISTANT THAN UNPROTECTED STEEL. HOWEVER, THE DIFFUSION COATED SPECIMEN WAS MORE RESISTANT. FOR HIGH TEMPS. THE MO COATING APPLIED BY FUSION IS PREFERABLE.. THE MO COATING ON ALLOY EI 437B HAD NO EFFECT ON THE CORROSION IN 30PERCENT HNO SUB3 AND ALMOST NONE ON THE HEAT RESISTANCE OF THE ALLOY AT 1050DEGREES. IT PROVED VERY RESISTANT IN PB-BI EUTECTIC AT 700DEGREES.

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--DETERMINING THE REAL STRESS CONCENTRATION ,IN WORKED METALS, BY MEANS OF MOLTEN METALS -U-

AUTHOR-(02)-CHAYEVSKY, M.I., MINEYEV, A.S.

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. MEKHAN. MAT., 1970, 6, (1), 104-105

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--STRESS CONCENTRATION, STRESS ANALYSIS, INTERNAL STRESS, ZINC, AMALGAM, BRITTLE FRACTURE, METAL DIFFUSION, GRAIN BOUNDARY, LIQUID METAL PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1681 STEP NO--UR/0369/70/006/001/0104/0105

CIRC ACCESSION NO--AP0129051

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0129051

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RELATION BETWEEN THE STRESS CONCENTRATION OF WORKED METAL PARTS AND THE INTERACTION OF THE CORRESPONDING MATERIALS WITH MOLTEN METALS AND METALLIC MIXTURES IS DISCUSSES. THUS ON APPLYING A SATURATED SOLUTION OF ZN IN HG TO A WORKED ZN PLATE THE LATTER UNDERGOES BRITTLE FRACTURE AT A SHARPLY DEFINED STRESS AS A RESULT OF THE DIFFUSION OF HG INTO THE PLATE ALONG GRAIN BOUNDARIES. IN THE SAME WAY A PB,SN MELT PRODUCES BRITTLE FAILURE IN C STEEL. THE POSSIBILITY OF SETTING UP A SYSTEM OF SOLID METAL-MOLTEN METAL PAIRS SO THAT THE MOLTEN METAL MAY BE USED AS A CONVENIENT INDICATOR OF THE STATE OF STRESS IN THE SOLID METAL IS CONSIDERED.

UNCLASSIFIED

USSR

UDC: 621.391.2

KOSTENKO, N. L., CHAYEVSKIY, Ye. V.

"Transverse and Longitudinal Correlation of Energy Flux Densities"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 11, Nov 72, pp 2295-2303

Abstract: A correlation analysis is made of fluctuations due to spatial displacement of the observer. Fairly simple formulas are derived, and the correlation coefficients are calculated for the angular coordinates of the energy flux density vector, as well as the correlation coefficients of the modulus of this vector. The influence of the trajectory of motion of the observer is considered as well as the effect of the geometry of multiple-element reflectors on the correlation coefficients.

1/1

Coatings

VADIVASOV, D. G., KUBAYEV, K. YE., CHAYKA, B. I., and LAPKO, P. N., Saratov Institute of Mechanization of Agriculture imeni M. I. Kalinin; Institute of Problems of Material Science, Academy of Sciences Ukrainian SSR

"Effect of Conditions of Plasma Spraying on the Cohesion Strength of Steel Coatings"

Kiev, Poroshkovaya Metallurgiya, No. 9, Sep 70, pp 12-16

Abstract: This paper analyzes the possibility of using plasma spraying to increase the wear resistance and restore the worn surfaces of automotive and tractor parts. The basic factor determining the practical application of sprayed coats is their cohesion strength with the sprayed surface. In this case the cohesion strength of plasma sprayed steel coats was determined as a function of geometric and electric parameters of the process. Use was made of the UPU-3M plasma unit and high-carbon U8A steel. Normalized 45 steel served as the backing material. The cohesion strength of the

USSR

VADIVASOV, D. G., et al, Poroshkovaya Metallurgiya, No. 9, Sep 70, pp 12-16

plasma-sprayed steel coat was tested by the pin method and was found to be 2.5 to 3 times higher than that produced by gas flame and electrometallizing. The recommended optimum conditions for plasma spraying of U8V steel coats are: L=120 mm (spraying distance); I=450 amp, V=30 v, Q=17 l/min, G=0.86 m/min at a 1.8-mm wire diameter.

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Semiconductors and Transistors

USSR

UDC 621.315.592

TARATUTA, A. S., CHAYKA, G. YE.

"Surface Current Interference"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 5, No 3, March 1971, pp 377-384

Abstract: A theoretically new physical model of noise formation in the surface domain is proposed. The basic difference of the model from all known ones is consideration of relaxation phenomena occurring as a result of traps in the space charge domain of the surface layer. As a result of this type of relaxation-generation phenomena, the current in the external circuit is a quasistationary pulse process. Basic theories of surface noise are developed on the basis of the proposed model: the mechanism of 1/f noise is described analytically, and the nature of the spectrum of the frequency-independent component of the surface noise for various magnitudes of bending of the zones are investigated; a number of other phenomena not fully explained by the existing series are also studied.

It is noted that if there are traps in the space charge layer with different energy levels, the observed frequency-dependent component of the

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002200520013-6"

USSR

TARATUTA, A. S., et al., Fizika i Tekhnika Poluprovodnikov, Vol 5, No 3, March 1971, pp 377-384

noise spectrum is basically determined by the traps with relatively low probability of recombination, which are in the majority. The noise current of the surface region is the sum of two components: the component with uniform frequency spectrum in the entire operating band and the component with the 1/f type spectrum.

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USSR

UDC 535.34

CHAYKA, M.

"Light Absorption by Vapors With Hidden Alignment"

Leningrad, Optika i Spektroskopiya, Vol 31, No 5, 1971, pp 670-676

Abstract: The hidden alignment is defined as having an axis of symmetry in the same direction as the motion of the atom. This paper considers the possibility of finding the hidden alignment from the absorption of light from an outside source. In absorption of light by vapors with hidden alignment, the absorption is a function of the angle between the direction of the magnetic field and the direction of propagation of the light wave, as well as the magnetic field intensity. Two particular cases are considered: the first, when the direction of the incident light is the same as the magnetic field; the second, when the direction of the light is at right angles to the magnetic field. In the first case, the result is independent of the light polarization; in the second, the absorption is a function of the polarization,

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USSR

CHAYKA, M., Optika i Spektroskopiya, Vol 31, No 5, 1971, pp 670-676

and the problem is solved for linearly polarized light in which the polarization vector is arbitrarily directed. This article is the third of a series by the same author, the first two of which were published in the same journal (30, 1971, p 822; 31, No 4, 1971). The first described the phenomenon of hidden alignment; the second considered its effect on capture of the resonance radiation.

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USSR UDC 632.4:582.285.22:633.11(471.4)

LEKOMTSEVA, S. N., VOLKOVA, V. T., and CHAYKA, M. N., Chair of Lower Palnts, Moscow State University

"Physiological Races of the Pathogen of Wheat Stem Rust in Some Regions Along the Volga River"

Leningrad, Mikologiya i Fitopatologiya, Vol 5, No 2, 1971, pp 161-166

Abstract: Data on the specialization of such pathogens as Puccinia graminis Pers. were collected, starting in 1964, to study the occurrence and development of wheat stem rust in the irrigated regions along the Volga. The territory can be divided into three groups, according to the frequency of occurrence of the disease. Conventional methods were used to determine physiological races of the pathogen. Eleven races of P. graminis f. sp. tritici were identified in the Saratov, Kuybyshev and Volgograd regions. Two to three races predominated. The race composition of wheat stem rust was more homogeneous in commerical fields than on plants of selection stations. It was found that all types of wheat studied were highly susceptible to races of fungus distributed over the regions along the Volga. More experiments in nature are necessary for future selection of wheat immune to this disease. 1/1

1/2 023 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--COLLISIONS OF EXCITED THALLIUM ATOMS IN THE 6 PRIME2 D SUBTHREE HALVES STATE WITH NITROGEN AND HYDROGEN -U-

AUTHOR-(03)-RITINS, E., CHAYKA, M.P., CHERENKOVSKIY, V.A.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(4), 636-40

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--COLLISION CROSS SECTION, EXCITED STATE, THALLIUM, ATOM, NITROGEN, HYDROGEN, MOLECULE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1034 STEP NO--UR/0051/70/028/004/0636/0640

CIRC ACCESSION NO--AP0124693

UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0124693

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COLLISION CROSS SECTIONS WERE DETD. FOR TL IN THE EXCITED T PRIME2 D SUBTHREE HALVES STATE WITH N AND H MOLS. BY OBSERVING THE QUENCHING OF THE LUMINESCENCE AND ITS POLARIZATION FOR THE 351.9 AND 352.9-NM LINES AND BY DETG. THE RELATIVE INTENSITY OF THE LINES. THE APP. DESCRIBED EARLIER WAS USED (S. TEPLOVA, ET AL., 1968). THE VALUES OF THE EFFECTIVE COLLISION CROSS SECTIONS ARE TABULATED.

UNCLASSIFIED

USSR

UDC 616.2-022.822.8-057-08

CHAYKA, N. A., and YAKOVSKAYA, M. YE., Institute for the Advanced Training of Physicians imeni S. M. Kirov

"Occupational Fungal Allergy and Methods of Detecting It"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 3, 1972, pp 32-36

Abstract: Since a large number of workers employed in industrial plants manufacturing citric acid suffer from upper respiratory diseases and since the mold Aspergillus niger is used in the industrial fermentation process, serological and allergy tests were performed on 102 workers to examine their health. The results were positive in a high percentage of workers continuously exposed to mold spores (surface fermentation shop, laboratory, and spore preparation division) but only in single cases among other workers (chemical division and deep fermentation shop). The recommendation is made to prevent the spread of the spores by enclosing the equipment in airtight casings and to install respirometers for workers in especially exposed positions.

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1/2 025 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--FUNGUS DAMAGE AND ITS PREVENTION IN TISSUES PRESERVED IN A POLYMER -U-

AUTHOR-(02)-CHAYKA, N.A., NIKITIN, V.V.

COUNTRY OF INFO--USSR

SOURCE--MIKOL. FITOPATOL. 1970, 4(1), 61-5

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--TISSUE TRANSPLANT, BONE, BIOLOGIC STORAGE STABILITY, FUNGICIDE, YEAST

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/0521 STEP NO--UR/9063/70/004/001/0061/0065

CIRC ACCESSION NO--AP0126269

UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0126269

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. NA SALICYLATE, BORIC ACID, PHOH, AND BZOH WERE EFFECTIVE FUNGISTATICS FOR 22 STRAINS OF AIRBORNE MOLD AND YEAST SPORES FOR GREATER THAN 1.5 YEARS AT 0.03-0.25PERCENT CONCNS. IN POLY(METHYLSILOXANES), USED TO PRESERVE BONE TISSUES FOR TRANSPLANT, EXPOSED UNDER CONDITIONS COMPARABLE WITH THOSE DURING TISSUE PRESERVATION OPERATIONS. LESS EFFECTIVE ADDITIVES TESTED WERE KI, CITRIC ACID, AND NA SUB2 S SUB2 O SUB3. FACILITY: LENINGRAD, GOS. INST. USOVERSH. VRACH. IM. KIROVA, LENINGRAD, USSR.

UNCLASSIFIED

1/2 022 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--THE EFFECT OF THE DEGREE OF PURIFICATION OF BISMUTH SINGLE CRYSTALS ON THE ANISTROPY OF THERMO EMF -U-
AUTHOR-(03)-PILAT, I.M., CHAYKA, S.V., OKHREM, V.G.

COUNTRY OF INFO--USSR

SOURCE--IZV. SSSR. MOSCOW, NEORGANICHESKIYE MATERIALY, VOL 6, NO 5, MAY 70, PP 982-983
DATE PUBLISHED----MAY70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--BISMUTH ALLOY, METAL SINGLE CRYSTAL, METAL ZONE MELTING, HIGH PURITY METAL, CRYSTAL ANISOTROPY, METAL MELTING, THERMOELECTROMOTIVE FORCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1542 STEP NO--UR/0363/70/006/005/0982/0983

CIRC ACCESSION NO--AP0133465
UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0133465

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A STUDY WAS MADE OF THE RELATIONSHIP BETWEEN THE ANISOTROPY OF THERMO EMF AND THE DEGREE OF PURIFICATION OF BI SINGLE CRYSTALS. IT WAS FOUND THAT IN TEMPERATURE INTERVALS 120-200DEGREESK AND 280-400DEGREESK A IS PRACTICALLY INDEPENDENT OF TEMPERATURE, BUT SHOWS DIFFERENT VALUES WHICH ARE RELATED TO THE PURITY OF SAMPLES. THE STUDIES WERE CARRIED OUT ON SAMPLES CUT PARALLEL TO THE TRIGONAL AXIS AND PERPENDICULAR TO IT. IT IS CONCLUDED THAT IN ORDER TO OBTAIN HIGH PURITY BI SUITABLE FOR THERMOELECTRIC AND THERMOMAGNETIC STUDIES, IT IS NECESSARY TO USE DOUBLE DROP MELTING AND ZONE MELTING (AT LEAST 50 PASSAGES) METHODS. FACILITY: CHERNOVTSY STATE UNIVERSITY.

UNCLASSIFIED

USSR C UDC 546.87:548.55

PILAT, I. M., CHAYKA, S. V., OKHREM, V. G., Chernovtsy State University

"The Effect of the Degree of Purification of Bismuth Single Crystals on the Anisotropy of Thermo-emf"

Moscow, Neorganicheskiye Materialy, Vol 6, No 5, May 70, pp 982-983

Abstract: A stydy was made of the relationship between the anisotropy of thermo-emf a and the degree of purification of Bi single crystals. It was found that in temperature intervals 120-200°K and 280-400°K a is practically independent of temperature, but shows different values which are related to the purity of samples. The studies were carried out on samples cut parallel to the trigonal axis and perpendicular to it. It is concluded that in order to obtain high-purity Bi suitable for thermoelectric and thermomagnetic studies, it is necessary to use double drop-melting and zone-melting (at least 50 passages) methods.

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USSR UDC 621.372.414.2

FIALKOVSKIY, A. T., CHAYKA, V. YE.

"Coaxial Open Resonator formed by Barrel-Shaped Outer and Cylindrical Inner Mirrors"

Gor'kiy, Izvestiya vysshikh uchevnykh zavedeniy, Radiofizika, Vol XV, No 1, 1972, pp 117-125

Abstract: A theoretical calculation was made of the basic parameters of the open coaxial resonator formed by barrel-shaped outer and cylindrical inner mirrors. Analytical expressions were obtained for the natural frequencies, the position of the caustics, the field distribution and the ratio of the Q-factors of various types of oscillations for $2\pi d/\lambda \gg 1$ (λ is the wavelength, d is the characteristic dimension of the resonator). The results of the numerical calculations permit selection of the resonator geometry for practical applications. The analysis performed shows that the selection of the azimuthal forms both respect to frequency and Q-factor is insufficient, and in practical devices it is necessary to take additional measures to isolate the operating form of the oscillations.

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1/2 020 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--VINYL FLUORIDE -U-

AUTHOR--KORINKO, V.A., LEVINSKIY, M.I., CHAYKA, YE.A., ENGLIN, A.L.

COUNTRY OF INFO--USSR

SOURCE--USP. KHIM. 1970, 39(1), 94-111

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--VINYL COMPOUND, FLUORINATED ORGANIC COMPOUND, POLYMER PHYSICAL PROPERTY, POLYMERIZATION, POLYVINYL FLUORIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/1696 STEP NO--UR/0074/70/039/001/0094/0111

CIRC ACCESSION NO--AP0100293

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0100293

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A REVIEW WITH 299 REFS DESCRIBING THE PREPN., PROPERTIES, POLYMN, AND COPOLYMN. OF VINYL FLUORIDE. THE PROPERTIES AND USES OF POLY (VINYL FLUORIDE) ARE ALSO DESCRIBED.

0123

UNCLASSIFIED

USSR

UDC 541.125

FEDOTOV, V. G., CHAYKIN, A. M., Institute of Chemical Physics of the USSR Academy of Sciences, Moscow

"Study of the 'Cold' Flame of the Fluorine Reaction with Hydrogen in a Flow"

Moscow, Doklady Akademii Nauk SSSR, Vol 203, No 2, 1972, pp 406-408

Abstract: The first and second limits of self-ignition in the fluorine reaction with hydrogen were discovered previously and proofs were obtained for the branch-chain mechanism of this reaction. Branching of the chains is realized in the reaction $H_2^* + F_2 \rightarrow H + HF + F$ where H_2^* is the hydrogen molecule excited vibrationally during almost resonance energy exchange in the process $HF^* + H_2 \rightarrow HF + H_2^*$. When studying the self-ignition limits of fluorine mixtures with deuterium, it was concluded [V. I. Vedeneyev, et al., Kinetika i kataliz, No 11, 36, 1970] that in the branching reaction $D_2^* + F_2 \rightarrow D + DF + F$, the D_2^* molecule must be excited to the vibrational level $v > 2$. A study has now been made to determine what vibrational level of the hydrogen molecule (first or higher) is responsible for branching of the chains, that is, to answer the question of linearity of the branching. The conditions of obtaining the cold flame of a mixture of fluorine with hydrogen were found, and the kinetic characteristics

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FEDOTOV, V. G., et al., Doklady Akademii Nauk SSSR, Vol 203, No 2, 1972, pp 406-408

of development of the flame were obtained. A study was also made of the flame by the method of optical spectroscopy and electron paramagnetic resonance.

A study of the dependence of the induction period on the initial condition for the reaction of fluorine with deuterium indicated the significant role of quadratic branching in this reaction.

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USSR

UDC: 621.315.592

MEN'SHIKOVA, V. A., OKUN', L. S., ZATULOVSKIY, L. M., CHAYKIN, P. M., FRIMER, A. I., All-Union Scientific Research Institute of Electrothermal Equipment

"Feasibility of Making Photodiodes Based on Single Crystal Germanium Strips Grown by the Stepanov Method"

Moscow, Izv. AN SSSR, Ser. Fizicheskaya, Vol 36, No 3, Mar 72, pp 525-528

Abstract: A study is made of the possibility of growing gallium arsenide epitaxially on germanium single crystal strips, and producing photodiodes from the resultant structures. The single crystal germanium strip was grown by the Stepanov method, using a floating shaper and a seed holder on a flexible suspension. A gas-transport reaction in an open tube was used for growing the epitaxial layer of gallium arsenide. The *pn* junction was formed by arsenic diffusion. Mesa photodiodes were made by photolithography. It was found that the integral sensitivity of photodiodes based on single crystal strips is greater than that of diodes based on ordinary germanium. This is attributed to the thinner epitaxial layer of GaAs since losses of light are proportional to the thickness of this layer. This is confirmed by spectral characteristics.

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USSR

UDC: 537.31

OKUN', L. S., KAGANOVSKIY, I. P., LEPIKHOVA, Ye. Ye., ZATULOVSKIY, L. M., CHAYKIN, P. M., LEVINZON, D. I., All-Union Scientific Research Institute of Electrothermal Equipment

"Investigation of Resistivity Distribution in a Single Crystal Germanium Strip by the Single-Probe Method"

Moscow, Izv. AN SSSR: Ser. Fizicheskaya, Vol 36, No 3, Mar 72, pp 614-618

Abstract: The distribution of resistivity is studied by single-probe measurements on a single crystal germanium strip with spacing down to 10 μ. The strips were grown by the Stepanov method in directions <110> and <112>, the plane of the strip being (111). The specimens were doped with Ga and Sb for *p*- and *n*-conductivity respectively. It was found that the longitudinal nonhomogeneity is greater than the transverse nonhomogeneity, and that both types of nonhomogeneity increase with a reduction in the discrete measurement step. The distribution of nonhomogeneity in the resistivity of [illegible] is basically periodic with a periodicity of [illegible] conditions of growth. In transverse direction [illegible] would be more random with a periodicity of 1/2

UN', L. S. et al., IAN SSSR: Ser. Fiz., V 36, 1972, pp 614-618

100-125 μ. Fine impurity bands of about 10 μ were observed which are apparently due to the periodicity of the crystallization process occasioned by liberation of the latent heat of fusion. The higher homogeneity observed in p-germanium is attributed to the weaker relation between the effective coefficient of distribution of Ga and periodic fluctuations in growth rate.

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USSR

UDC: 53.082.52

ARTYSHEVSKIY, P. P., SADDE, V. V., ZAYTSEVA, A. K., ZAPULOVSKIY, L. M., KRAVETSKIY, D. Ya., STREL'TSOVA, V. I., CHAYKIN, P. M., All-Union Scientific Research Institute of Electrothermal Equipment

"Photovoltaic Cells Made From Silicon Crystals With Special Cross Sectional Shapes Grown by the Stepanov Method"

Moscow, Izv. AN SSSR: Ser. Fizicheskaya, Vol 36, No 3, Mar 72, pp 522-524

Abstract: A previously described method (Artyshevskiy, P. P. et al., Izv. AN SSSR: Ser. Fiz., Vol 35, 1971, p 469) was used for growing noncylindrical silicon crystals to be tested in solar batteries. Polycrystal and single crystal specimens of p-conductivity with resistivity ranging from 0.1 to 15 Ω·cm were grown, cut transversely into thin plates and polished on one face. The pn junction was made by phosphorus diffusion. The finished cells had an area of 0.8-1.2 sq. cm. Cells made from polycrystals had higher [illegible] than [illegible] cells. The shunt resistance of the [illegible] purity of the [illegible] were not as [illegible] those of the polycrystal cells, which was attributed

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FYSHEVSKIY, P. P. et al., IAN SSSR: Ser. Fiz., V 36, 1972, pp 522-524

.o the low purity of the single crystal material as evidenced by low shunt resistance. This same index shows that contamination is a random factor rather than being due to the method of crystal growing. On the whole, the results show that photovoltaic cells made from noncylindrical crystal rods are at least as good as cells made from Czochralski crystals.

1/2 019 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--THE ROLE OF PYOCOCCAL INFECTION IN THE PATHOGENESIS OF MYCOTIC PROCESS -U-

AUTHOR-(02)-MARYASIS, YE.D., CHAYKINA, A.A.

COUNTRY OF INFO--USSR

SOURCE--VESTNIK DERMATOLOGII I VENEROLOGII, 1970, NR 6, PP 45-50

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--SKIN DISEASE, FUNGUS DISEASE, PATHOGENESIS, HYALURONIDASE, DRUG TREATMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/1386 STEP NO--UR/0206/70/000/006/0045/0050

CIRC ACCESSION NO--AP0133338

UNCLASSIFIED

2/2 019 UNCLASSIFIED

CIRC ACCESSION NO--AP0133338 PROCESSING DATE--20NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CLINICO EXPERIMENTAL STUDIES INDICATE THAT PYOCOCCAL INFECTION MANIFESTED ON THE SKIN OR RUNNING A LATENT COURSE IS CONDUCTIVE TO A CHANGE OF SUBCLINICAL DERMATOMYCOSIS INTO ACUTE AND OF LOCALIZED, INTO EXTENSIVE DISEASE. THE ACTIVITY OF MICROBIAL HYALURONIDASE AND DEPOLIMERIZATION OF MUCOPOLYSACCHARIDES AND INTERSTITIAL SUBSTANCE OF DERMA AND VESSELS DEVELOPING UNDER ITS EFFECT UNDERLIE THIS PROCESS. THESE DATA SHOW NEW ASPECTS OF PATHOGENESIS OF MYCOTIC DISEASES AND EXTEND PROSPECTS OF THEIR THERAPY.

FACILITY: KAFEDRA KOZHNYKH BOLEZNEY STAVROPOL'SKOGO MEDITSINSKOGO INSTITUTA.

UNCLASSIFIED

USSR

UDC 542.65:546.799.3

CHAYKHORSKIY, A. A.

"Isolation of Neptunium (IV) by Means of Hydrazine"

Leningrad, Radiokhimiya, Vol 12, No 5, 1970, pp 794-795

Abstract: A laboratory method is proposed for the preparation of pure salts and for regeneration of neptunium from solutions, using hydrazine. The method is based on the fact that in concentrated nitric acid and in the presence of hydrazine neptunium is reduced rapidly to the tetravalent form and precipitates out as an insoluble double salt of hydrazine hexanitrate neptuneate and hydrazine nitrate $(N_2H_4)_2[Np(NO_3)_6]\cdot nN_2H_5NO_3$. Its solubility in the above medium is less than 0.01 g/l. Using this method neptunium may be easily recovered by heating. In addition, the use of concentrated nitric acid provides additional purification of neptunium from various admixtures.

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FUDIM, Ye. V., GOLOD, A. L., CHAYKO, A. L., and SLOBODKIN, V. M.

"Pneumatic Computing Device"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 27, 1972, p 163, No (11) 351220

Translation: This device contains an input converter in the form of a pulsating resistance, the output of which is connected to the input of a gas flow integrator. For the sake of accuracy and structural simplicity, the device contains a block for removing the constant portion of the gas flow. The control channel of the gas is connected to the output of the device, the input channel is connected to the integrator input, and the output is connected to a constant pressure source.

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1/2 007 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--MOBILITY OF TWINNING DISLOCATIONS IN CALCITE -U-

AUTHOR--SOLDATOV, V.P., STARTSEV, V.I., CHAYKOVSKAYA, N.M., DANILEVICH, T.O.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(1) 79-82

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--CRYSTAL DISLOCATION, CALCITE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0638 STEP NO--UR/0181/70/012/001/0079/0082

CIRC ACCESSION NO--AP0105617

UNCLASSIFIED

2/2 007 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0105617

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE METHODS OF SELECTIVE ETCHING AND IMPULSE LOAD OF THE CRYSTALS WERE USED TO INVESTIGATE THE MOBILITY OF TWINNING DISLOCATIONS IN CALCITE. THE VELOCITIES OF THE TANGENTIAL MOVEMENTS OF TWINNING DISLOCATIONS ALONG THE TWINNING BOUNDARY WERE MEASURED IN THE REGION OF SHEAR STRESS TAU 30-35 G-MM PRIME2. IN THE ABOVE INTERVAL OF STRESSES, THE TWINNING DISLOCATION VELOCITY V CHANGES FROM 2 TIMES 10 PRIME NEGATIVE4 TO 6.9 CM-SEC. THE MOBILITY CURVE FOR THE TWINNING DISLOCATIONS IN CALCITE IN THE COORDINATES LOG V VS TAU HAS LINEAR (THERMALLY ACTIVATED BRANCH OF THE MOBILITY CURVE) AND NONLINEAR (ATHERMAL BRANCH) SECTIONS, WITH THE INFLECTION POINT IN THE STRESS REGION OF 45 G-MM PRIME2. THE ACTIVATION VOL. (GAMMA) FOR THE LINEAR SECTION OF THE V-GAMMA CURVE IS 2.8 TIMES 10 PRIME NEGATIVE19 CM PRIME2, AND THE SENSITIVITY (M) OF V TO THE STRESS IS 15.

UNCLASSIFIED

USSR UDC 615.332 (Cycloserinum). 014.453

SAZYKIN, Yu. O., CHAYKOVSKAYA, S. M., KORCHAGIN, V. B., PANINA, M. A., IVANOVA, V. N., BALITSKIY, V. A., and VAYNER, Ye. A., All-Union Scientific Research Institute of Antibiotics and Institute of Biophysics, Ministry of Health USSR

"Sterilization of Oxacillin Preparations With Fast Electrons"

Moscow, Antibiotiki, No 10, 1971, pp 933-936

Abstract: Exposure of preparations of the sodium salt of oxacillin in 0.5 g vials to fast electrons (10 Mev) in a linear accelerator at a dose of 2.5 Mrad resulted in complete sterility of the antibiotic, whereas, tests of control (nonirradiated) vials revealed contamination in every second or third vial. The induced radioactivity of the samples did not exceed $3.7 \cdot 10^{-10}$ curie even with minimum length of exposure. The procedure had no effect on the antibiotic activity, pharmacological activity (no evidence of toxicity or pyrogenicity) or physicochemical properties of the preparations.

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USSR

UDC:534.282

MATVEYEV, V. V., CHAYKOVSKIY, B. S., KOVALEV, M. S., RZHAVIN, L. N., Kiev

"Influence of Design Peculiarities and Loading Conditions on the Damping Ability of a Herringbone Lock Joint of a Turbine Blade"

Kiev, Problemy Prochnosti, No 10, Oct 73, pp 66-70

Abstract: Results are presented from an experimental and theoretical study of design damping in the herringbone lock joints of turbine blades. The influence of a number of design and technological factors is studied, as well as the influence of loading parameters on the damping ability of lock joints.

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USSR

UDC: 539.67:620.178

MATVEYEV, V. V., CHAYKOVSKIY, B. S., BOCHAROVA, L. A., Institute of Strength Problems, Academy of Sciences of the UkrSSR

"Damping Properties of Turbine Blade Materials at Working Temperatures"

Kiev, Problemy Prochnosti, No 4, Apr 73, pp 8-14

Abstract: The paper analyzes the results of a systematic examination of the damping properties of twenty kinds of turbine blade materials heat treated in different ways (41 states in all were investigated). The studies were done by a standard procedure under normal and high-temperature conditions on specimens with working sections of 4 x 15 x 150 and 2 x 4 x 100 mm subjected to pure bending oscillations on the D-5 and D-7 testing machines. The frequency of oscillations ranged from 10 to 50 Hz. The damping properties of all materials were found to depend to some extent on the amplitude of cyclic damping and temperature. Titanium, aluminum and nickel alloys characteristically show a very slight increase in logarithmic decrement with increasing stress. The logarithmic decrement was found to be most highly dependent on amplitude for steels of the martensite-ferrite class. The logarithmic decrement generally increased

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