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GOLOVKIN, N.A., doktor tekhn.nauk, prof.; STRAKHOVICH, K.A., inzh.; TSVETKOV, A.I., inzh.

Problem of apple storage under sub-freezing temperatures. Khol.-tekh. 39 no.2:32-33 Mr-Ap '62. (MIRA 15:4)

1. Leningradskiy tekhnologicheskiy institut khlodil'noy promyshlennosti.

(Apples--Storage)

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GOLOVKIN, N.A.; PERKEL', R.L.; STRAKHOVICH, E.K.

Methods for determining apple viability in case of cold storage. Izv. vys. ucheb. zav.; pishch. tekh. no.4:144-148 '63. (MIRA 16:11)

1. Leningradskiy tekhnologicheskiy institut kholodil'noy promyshlennosti, kafedra obshchey i kholodil'noy tekhnologii.

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Angular Oscillations of the rotor of the Synchronous Motor of a Piston Compressor

Sb. Nauch. Rabot Leningr. Tekhnol. In-ta Kholodil'noy Prom-sti. Vol 6, 1956, 15-27

The author transforms the original differential equation of motion (of a machine consisting of a compressor with a flywheel), which defines the unknown angle of oscillation of the rotor, into a second order differential equation whose coefficients are known functions of the period. He derives periodic solutions of this latter equation and investigates their stability. (KhZhMat. No 3, 1959)

SO: Sum-No 797, 29 Jan 56

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SOV/124-57-7-7572

Translation from: Referativnyy zhurnal Mekhanika, 1957 Nr 7, p 16 (USSR)

AUTHOR: Strakhovich, O. A.

TITLE: On the Geometric Elements of an Involute Helical Surface (K voprosu o geometricheskikh elementakh evol'ventnoy vintovoy poverkhnosti)

PERIODICAL: Sb. tr. obshchetekhn. kafedr. Leningr. tekhnol. in-t kholodil'n. prom-sti, 1956, Vol 12, pp 142-147

ABSTRACT: The author evolves equations for an involute helical surface in terms of the Cartesian coordinates and determines the angles of obliquity and the radii of curvature at an arbitrary point on that surface.

V. N. Geminov

Card 1/1

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STRAKHOVSKAYA, Ye., kand. sel'skokhoz. nauk; KIRIMOV, G., mladshiy nauchnyy sotrudnik

Protecting sweet cherries from the cherry fruit fly Rhagoletis cerasi L. Zashch. rast. ot vred. i bol. 10 no.7:53 '65. (MIRA 18:10)

1. Sayestanskiy nauchno-issledovatel'skiy institut sel'skogo khozyaystva.

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CA STRAKHOVSKAYA, Ye N.

Gaseous limacides of instantaneous action in controlling Limacidae. E. N. Strakhovskaya. [illegible] Zoovet. Abad. N'ado-Kha Nauk im. P. I. Lenina 16, No. 10, 34-41(1949).—Comparison of NaCl, NH_4Cl, KCl, $FeSO_4$, $(NH_4)_2SO_4$, $(NH_4)_2CO_3$, and 1.2% soln. of NH_3 show that the last two are most effective in killing the slugs in 1.5 sec. A 3% soln. of NH_3 causes instantaneous death of the slugs. [illegible] J. S. Joffe.

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STRAKHOVSKIY, G. M.

Mbr., Lab. Surface Forces, Inst. Phys. Chem., Dept. Chem. Sci., Acad. Sci., -c1948-.
Mbr., Lab. Surface Forces, Inst. Colloid- and Electrochemistry, Dept. Chem. Sci., Acad. Sci., -1944-. "Measurement of the Viscosity of Wall-Adjacent Boundary Layers of Liquids by the Blow-Off Method," Acta. Phys., 19, No. 6, 1944; "Methods of Synchronization for Very Brief X-Ray Exposures," Vest. Ak. Nauk SSSR, No. 3, 1946.

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Methods of synchronization for very brief X-ray exposures. Dremin, O. M., and Thomsen, V. A. Bull. Acad. Sci. USSR, Ser. Sci. Tech. (No. 3) 371-94 (1953) In Russian.—Various methods are discussed which permit X-ray photography of pulse processes, such as passage of a bullet through a target, and the explosion of hand mills.

R. S.

Inst. Mech Eng., AS USSR, NII VVC, KA

METALLURGICAL LITERATURE CLASSIFICATION

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1232. MEASUREMENTS OF THE VISCOSITY OF BOUNDARY (SURFACE) LAYERS OF LIQUIDS BY THE BLOW-OFF METHOD. Deryagin, B.V., Strakhovskii, G. and Malysheva, D. (J. Exptl. Theoret. Phys. (U.S.S.R.), 1946, 16, 171-8; Chem. Abstr., 1946, 40, 5971).

A method was developed to measure the viscosity of layers of a liquid in contact with a solid wall and in function of the distance from this wall. This method consists in the blowing off by means of a stream of air of a layer of liquid in a small capillary, the diameter of which is calculated to be approximately 10 times the thickness of the layer. The thickness of the blown-off layer is measured in monochromatic light by photometry of the interference line. By use of this method it was observed that in oils and liquids the volumetric viscosity shows no anomalies down to layers of 10^{-5} cm. However, additions of "thickening means" such as Al naphthenate, Al oleate, or Al stearate, to turbine oil change the layer profile and give anomalies of viscosity.

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16

Apparatus for the Rapid Taking of Magnetization Curves, K. P. Belov and G. M. Strakhovskii, Kogi neevo' Digest (American Edition), v. 5, Mar Apr. 1948, p. 103 106. Translated and condensed from Zavodskaya Laboratoriya, no. 6, 1946, p. 577 582.

Gives details of method using a cathode-ray oscilloscope. Gives circuit diagrams, fundamentals of the method, and typical results.

METALLURGICAL LITERATURE CLASSIFICATION

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11-198. Apparatus for the Rapid Taking of Magnetization Curves. K P Belov and U M Strukhovskii. Experiment Digest (American Edition), v. 3, March-April 1948, p. 165-168. Translated and condensed from Zavodskaya Laboratoriya, no. 6, 1948, p. 677-682.

Details of method using a cathode-ray oscilloscope. Circuit diagrams, fundamentals of the method, and typical results.

METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

STRAKHOVSKIY, G.M.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1660

AUTHOR SOKOLOV, A.A., TERNOV, I.M., STRACHOVSKIJ, G.M.

TITLE The Investigation of the Stability of the Motion of Electrons in Cyclical Acceleration devices in consideration of Quantum Effects.

PERIODICAL Zurn.eksp.i teor.fis, 31, fasc.3, 439 - 448(1956)

Issued: 12 / 1956

In connection with this quantum-theoretical investigation of the motion of the electron in a magnetic field the possible occurrence of radial and also of axial oscillations is taken into account. Such problems are best solved in cylindrical coordinates r, z, φ.

Above all the motion in cylindrical betatron-like devices is explained, in which the magnetic field $\vec{H}$ is modified within the domain of the stationary orbit ($r=R_o$=const, z=0) according to the law h = const.r^{-q}. The mean value $\vec{H}$ is assumed to satisfy the WIDEROE condition $\vec{H}(R_o) = (2/R_o^2)\int_0^{R_o} r H(r)\, dr = 2H(R_o)$ and further be it assumed that div $\vec{H}$ = 0 and curl $\vec{H}$ = 0.

At first the adiabetic invariants and the equilibrium orbit are investigated. The electron orbit taking quantum effects into account can be determined by means of BOHR's theory, and results in first approximation agree with those of the rigorous quantum theory. This method is well suited for practical purposes. Here three adiabetic invariants are introduced which are in connection with the azimutnal, radial, and axial quantum members.

Next, the oscillations of the electron round the present equilibrium orbit are investigated on the basis of the classical theory. On this occasion the adiabetic invariants are supposed to be different from zero. The quantum-like corrections to

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STRAKHOVSKIY, G. M.

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INVESTIGATION OF STABILITY OF ELECTRON MOTION IN CYCLIC ACCELERATORS WITH QUANTUM EFFECTS ARE INCLUDED. A. A. Sokolov, I. M. Ternov, G. M. Strakhovskii (Moscow State Univ.) Soviet. Phys. JETP 4, 231-8(1957) March.

The general case of motion of electrons in cyclic accelerators has been investigated, taking account of quantum effects, when axial as well as radial oscillations are possible. It is shown that the quantum effects can be included by quantizing the adiabatic invariants according to the Bohr-Sommerfeld method. The effect of quantum fluctuations on radial-phase oscillations in a synchrotron is also investigated. Finally, the problem of quantum excitation of macroscopic oscillations is discussed. (auth)

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B006/B011

AUTHORS: Strakhovskiy, G. M., Kravtsov, N. V.

TITLE: Strong Magnetic Fields

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol 70, Nr 4, pp 693-714 (USSR)

TEXT: The present article offers a survey of the possibilities of producing strong magnetic fields. P. L. Kapitsa is said to be a pioneer in this field: in 1924 he already attained 5.10^5 oersteds by means of an accumulator discharge over a low-resistance solenoid, and $3.2.10^5$ oe with an electromechanical method in 1927. $1.6 \cdot 10^6$ oe are attainable today under laboratory conditions, which is by no means to be considered the upper limit. Table 1 offers a chronological picture of the magnetic field strengths attained by various authors, among whom V. S. Komel'kov, N. F. Aretov, and G. I. Budker are mentioned. The latter theoretically investigated the problem of the production of strong magnetic fields by the use of relativistically stabilized electron beams. L. N. Rozentsveyg pointed out the possibility of polarizing electron beams injected into accelerators by means of strong magnetic fields. A number of other fields of application of strong magnetic fields is briefly dealt with. Part II contains a discussion of electromagnets with iron cores, which are used up to 50 koe. Since such laboratory magnets must meet with a number of requirements (large H, easily accessible range of operation and a homogeneous

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Strong Magnetic Fields

field in the latter, good cooling, et al.), they constitute a compromise. Figure 1 illustrates such a typical magnet. When using common iron it is possible to attain 17,000 - 20,000 gauss, and up to 26,000 gauss if special alloys are employed. With a special shape of the pole pieces it is possible to attain 70 koe; figure 2 shows such a case. The requisite of field homogeneity in the range of operation opposes a limit to an increase in the field strength by a special shape of the pole pieces. Figure 4 shows a photograph of a laboratory electromagnet, the characteristics of which are given. Figure 5 illustrates the dependence of the H on the gap width. Part III deals with the iron-free electromagnets with constant field, i. e. construction and theory of solenoids. First, the theory of solenoids with constant current density is briefly dealt with and next, solenoids with optimal radial distribution of the current are discussed. Figure 7 shows a schematic representation of such a solenoid which makes it possible to attain as much as 10^5oe. Figure 8 illustrates the field distribution along the solenoid axis, figure 9 the dependence of the H on the solenoid diameter with different powers (20-3000 kw). Part IV is devoted to the pulsed magnetic fields. Field strengths exceeding 10^5oe can be attained in solenoids fed by pulsed currents. Such currents are attained by condenser discharge, discharge of chemical batteries, and on the electromechanical way. Figure 10 shows a basic scheme of such a system, the theory of which is

Card 2/3

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briefly dealt with. Both methods are frequently used (pulse duration 0.01 sec). In this case, cooling opposes considerable technical difficulties which are related in the first place with the strength of the solenoid. When cooling with nitrogen or helium, $2.5 \cdot 10^5$ oe can be attained during 0.1 sec, but in the theory it is then necessary to consider the change in conductivity of the solenoid. Next, such theories are dealt with: that of a solenoid with trapezoidal cross section and homogeneous current density distribution, such a solenoid in which the current density is inversely proportional to the radius, and a solenoid with rectangular cross section in which the current density is inversely proportional to the radius. Graphs, diagrams, and tables complete the representation. Part V briefly deals with form and duration of the pulses with special regard to the square pulses. The last part is devoted to the measurement of pulsed magnetic fields by the ballistic method (accuracy $\pm$ 1%), the Faraday effect, magnooptical and galvanomagnetic effects. Rogovskiy is mentioned. There are 27 figures, 5 tables, and 124 references, 48 of which are Soviet.

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24473

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D204/D303

9,2582

AUTHORS: Basov, N.G., Strakhovskiy, G.N., Cheremiskin, I.V.

TITLE: A study of dependence of molecular generator frequencies on various parameters. Part II. Line J=3, K=3

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 6, 1961, 1020 - 1028

TEXT: Following the theoretical analysis as given by N.G. Basov, A.V. Nikitin, and A.N. Orayevskiy (Ref. 5: Radiotekhnika i elektronika 1961, 6, 5, 796); the authors give in the present article the results of the experimental study of a molecular generator J=3 K=3 of ammonia $N^{14}H_3$. Its frequency was studied as dependent on the tuning of the resonator, on the voltage at the quadruple capacitor and pressure at the molecular beam source. The source, capacitor and resonator were very accurately designed. The beam was shaped by a 0.05 x 0.05 mm grid with the space factor of 0.25, thickness of the grid 0.05 mm. The diameter of the output beam -

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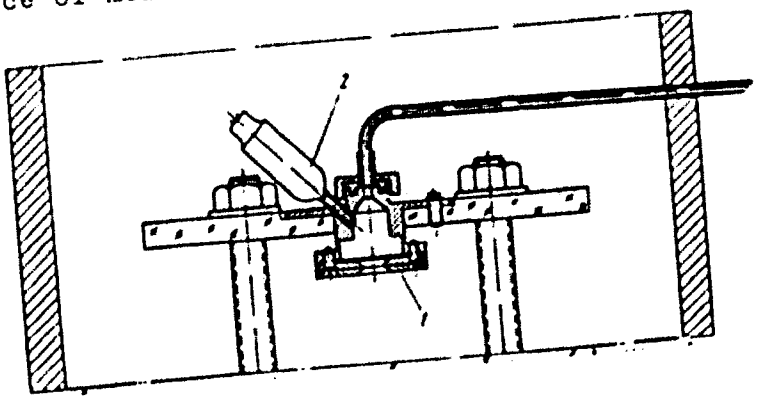
A study of dependence of ...

6 mm. Gas pressure inside the source was measured by a vacuum gauge BT-2 (VT-2). The pressure gauge tube ЛТ-4 (LT-4) was connected directly to the source camera (Fig. 2).

Fig. 2. Source of molecular beam 1 and pressure gauge tube 2.



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A study of dependence of ...

A diaphragm forming a very narrow molecule beam was inserted between the source and quadruple condenser. The diaphragm was liquid nitrogen cooled. The capacitor was 150 mm long with spacing between plates of 2 mm. The beam was entered into a resonator 80 mm. with E_{010} made of oscillatrons. The invar resonator had silvered walls, its Q 6000-8000. Tuning of the resonator within a few megacycles was achieved by a 2 mm diameter rod, screwed into the resonator to a depth up to 1 mm. The Q was not affected by tuning. The displacement of tuning rod by 0.1 mm (10 divisions on the Vernier) changed the resonant frequency of the resonator by approximately 0.5 mc/s and the generated frequency by approximately 1000 c/s. The resonant cavity was thermostatically controlled within 0.01°C, this change in temperature producing a frequency change of the generator of 1 c/s. The frequency changes in the generator due to changing its parameters were measured by comparing it with another generator, the frequency of which was kept constant within 2-5 c/s. The frequencies of three molecular generators differing

Card 5/6

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by a few hundred cycles, were mixed in a hybrid ring, actually a balanced mixer, to which was also applied the output of a heterodyning klystron 5, tuned to 23,830 Mc/s. From the balanced mixer the generated power was applied to F, a 40 Mc/s IF amplifier with a 2 Mc/s passband and gain of 10,000. The klystron local oscillator was frequently stabilized to approximately 50 kc/s. After the second detector, the signal having a frequency Δf between the difference of frequencies of molecular generators No. 3 and No. 2 was applied to an oscilloscope type Э0-7 (Eo-7) with the output of an audio generator ЗГ-12 (ZG-12) applied to the horizontal sweep terminals and Δf was measured from the Lissajous figures, the relative power change was measured simultaneously with Δf by means of deflecting part of the power from the resonator and by amplifying it in a narrow band IF amplifier (pass-band about 70 Kc/s), with double frequency conversion. Using the above method three series of graphs were taken. 1) Changes in amplitude (power) W and in generated frequency Δf as dependent on changes in pressure p at the source, for various fixed detunings v of resonator and various U

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0.012°C the long term relative stability

$$\frac{\Delta f}{f} \sim 10^{-11}.$$

It is also seen that tuning by pressure and voltage change does not seem to be very accurate since it would require too accurate changes in these quantities and, for the analyzed type of generator, tuning thus obtained could not be better than 10^{-9}. Finally, to increase the absolute stability of the generator, lines of ammonia without hyperfine structure should be used. [illegible], K 2 $N^{14}H_3$ or lines $N^{15}H_3$. There are 10 figures and 8 references: 3 Soviet-bloc and 5 non-Soviet-bloc. The four most recent English-language publications read as follows: J.C. Helmer, J. Appl. Phys. 1957, 28, [illegible]; K. Shimoda, J. Phys. Soc. Japan, 1957, 12, [illegible]06; K. Shimoda, J. Phys. Soc. Japan, 1958, 13, 339; F. Barnes, Proc. I.R.E., 1959, 47, 2085.

SUBMITTED: June 17, 1960

Card 6/6

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9.2582 (3002,2105)

S/188/61/000/001/009/009
B104/B203

AUTHORS: Lyubimov, G. P., Strakhovskiy, G. M., Cheremiskin, I. V.

TITLE: Simple method of tuning a molecular generator

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 3, fizika, astronomiya, no. 1, 1961, 79-81

TEXT: At the Moskovskiy gosudarstvennyy universitet (Moscow State University), a molecular generator was produced and put into operation in 1958, which operates with the lines I = 3 and K = 3 of $N^{14}H_3$ and corresponds to a type developed at the FIAN by N. G. Basov and A. M. Prokhorov (Ref. 1: Basov, N. G., Prokhorov, A. M., ZhETF, 27, 431, 1954; Ref. 2: Basov, N. G., Prokhorov, A. M., DAN, 101, 47, 1955; Ref. 3: Basov, N. G., "Radiotekhnika i elektronika", 1, 752, 1956). The molecular beam was formed in this molecular generator with a Cu-foil grid having square holes with a lateral length of 0.05 mm and a duty factor of 0.25. The authors studied a replacement of the grid by a single channel 10 mm long with various diameters. Optimum results were obtained with a channel 1.5 mm in diameter: as compared with the grid type, the signal-to-

Card 1/4

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noise ratio could be increased by the 2-3 fold. The signal-to-noise ratio was 20-30 db. Further, a simple method for the start-up and coarse adjustment was suggested. The principal stages of the start-up of the molecular generator are: tuning of the resonator for the absorption line, observation of the induced emission and generation, tuning of the resonator for the spectral line. In general, the transition from one stage to another is connected with changes in the radio circuit. The method suggested does not require any changes in the radio circuit, and permits a quick start of the molecular generator and a quick adjustment for the frequency of the spectral line with sufficient accuracy. Fig. 1 shows a block diagram of the arrangement. While the switch is closed, a saw-tooth voltage of a few kilocycles is applied to the auxiliary klystron of the "intensity gate". A frequency characteristic is observed on oscilloscopes, which consists of a number of narrow vertical lines each of which is a resonance curve of the narrow-band intermediate-frequency amplifier (band width 50-100 kc/sec). If the resonator is filled with ammonia at a pressure of 10^{-2}-10^{-4} mm Hg, the frequency characteristic of the resonator shows a trough due to ammonia absorption. In photographs of the oscilloscope trace, the absorption line is observed up to pressures of a few 10^{-5} mm Hg. With higher vacuum and

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application of a voltage to the sorting system, the trough caused by absorption disappears, and an ejection appears instead of the absorption line; the ejection is caused by the initially induced emission and also by the generation. The tuning of the resonator adjusts the generation line to the maximum of the resonance curve of the resonator with sufficient accuracy. After switching off the high-frequency saw-tooth voltage, the signal of the molecular generator is obtained on the oscilloscope. There are 4 figures and 3 Soviet-bloc references.

ASSOCIATION: Kafedra atomnoy fiziki (Department of Atomic Physics)

SUBMITTED: July 18, 1960

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Card 3/4

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Legend to Fig. 1:
(1) Molecular generator, (2) auxiliary klystron of the "intensity gate", (3) klystron supply, (4) saw-tooth generator, 0-10 kc/sec, (5) balancing mixer, (6) heterogeneous klystron, (7) klystron supply, (8) saw-tooth generator, 0-50 kc/sec, (9) intermediate-frequency amplifier for 40 Mc/sec with a pass band of 70 kc/sec, (10) oscilloscope.

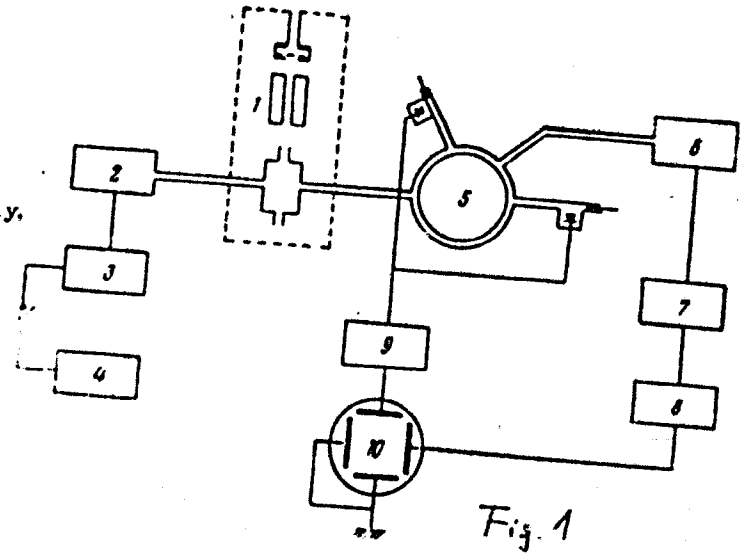

Fig. 1

Card 4/4

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27483

S/056/61/075/001/003/003
B125/B108

9,3592 also 1538,1057

AUTHORS: Gasov, N. L., Krokhin, O. N., Gravevskiy, A. N., Strakhovskiy, G. M., Chikhachev, B. M.

TITLE: Investigation of relativistic effects with the aid of molecular and atomic frequency standards

PERIODICAL: Uspekhi fizicheskikh nauk, v. 75, no. 1, 1961, 3 - 59

TEXT: The present paper gives a survey of experiments verifying the general theory of relativity, some problems in special relativity theory, and cosmological hypotheses by means of molecular and atomic frequency standards. V. L. Ginzburg (UFN, 22, 11 (1956); sb. "Eynshteyn i sovremennaya fizika", M., Gostekhizdat, 1956, str. 93 - 139) made suggestions for the experimental verification of general relativity theory. By means of cesium frequency standards with two separate resonators, an absolute frequency stability of $\pm 1.5 \cdot 10^{-10}$ was attained. A further improvement of the stability of cesium standards requires the use of narrower spectral lines. With slow molecule beams, an absolute stability

Card 1/4

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Investigation of relativistic effects... B125/B108

of up to 10^{-12} was reached. A certain increase of stability may be attained using a beam of thallium atoms instead of cesium. Up to now, however, the authors have no information on such use of thallium. The electrical resonance method, i. e., the use of spectral lines of a molecular beam caused by transitions between rotational levels, guarantees the same stability as in cesium standards. The frequency standards relying on spectral lines of monatomic alkaline metals permit very sensitive indications. Quartz resonators, too, give a stability of 10^{-10} and, when immersed in liquid helium, even of 10^{-11}. The power of molecular generators has to be amplified by means of a low-noise amplifier (e. g., ЛБВ(LBV)) and an amplifying klystron. Self-tuning is necessary for high-precision frequency measurements. In measurements of the gravitational frequency shift by means of molecular generators on board of artificial satellites, the influence of the first order Doppler effect has to be eliminated. This can be done, for instance, by an exact measurement of long time intervals on the Earth and on the satellite with subsequent comparison by radiocommunication. Another method of this kind is based on the mixing of a signal emitted from the Earth (frequency f) with the signal

Card 2/4

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of a molecular generator on the satellite (frequency 2f). Ionospheric and tropospheric fluctuations have to be taken into account. Measurements of the gravitational shift of frequency are being prepared (Sci. News Lett., 76, 35 (July 18, 1959)). The gravitational shift may be measured from two points of different altitude on the Earth's surface (mountain) without the use of satellites and, therefore, without consideration of the Doppler effect of first and second order. For H = 3.2 km and f = 10^{10} cps, $\Delta f = 3.4 \cdot 10^{-5}$ cps. At present, two first-order experiments are known for the verification of special relativity theory. In one of them (proposed by Møller and carried out by Townes), two inversely directed beams of excited ammonia molecules were sent toward each other through the horizontal resonators of two molecular generators mounted on a rotatable plate. The expected frequency deviations were not found in these experiments. The other first-order experiment with respect to (v/c) is based on the measurement of the phase difference of two nonsynchronized molecular generators placed on a rotatable base at a distance of a few meters. Some cosmological effects may be verified experimentally by means of highly stable atomic clocks. An idea of V. A. Fok (G. M. Strakhovskiy, Doklad na Lomonosovskikh chteniyakh v MGU, 1958) concerning singular reference

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Investigation of relativistic effects... B125/B108

systems is mentioned. The variations of the gravitational constant ($\delta g = g.10^{-10}$ within a year, according to Dirac) can be verified by comparing the motion of a high-precision atomic clock with the revolution period of an Earth satellite. The eccentricity of the Earth's orbit may also have an influence on the gravitational constant. The hypothetical time dependence $\delta\alpha/\alpha \sim 10^{-2}\,\delta g/g$ of the fine structure constant α (L. D. Landau et al., DAN SSSR, 95, 497, 773, 1177 (1954)) can be verified experimentally by comparing the motion of two atomic clocks of different types. The character of gravitation may be determined by another series of experiments. There are 31 figures and 115 references: 47 Soviet and 68 non-Soviet. The three most recent references to English-language publications read as follows: Missiles and Rockets, No. 1, 1961, p. 34; B. Hoffmann, Phys. Rev. 121, 337 (1961); S. M. Bergmann, J. Appl. Phys. 31, 275 (1960).

Card 4/4

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KARYAKIN, Nikolay Ivanovich; MYSTROV, Konstantin Nikolayevich; KIRILLOV, Petr Semenovich; STRAKHOVSKIY, G.M., red.; PERKOVSKAYA, G.Ye., red. izd-va; YEZHOVA, L.L., tekhn. red.

[Brief handbook on physics]Kratkii spravochnik po fizike. Moskva, Vysshaia shkola, 1962. 599 p. (MIRA 15:11)
(Physics)

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S/056/62/042/003/043/049
B152/B102

24.6410
9.2582

AUTHORS: Strakhovskiy G. M., Tamarenkov V. M.

TITLE: Radiation of molecules under resonance conditions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 907-908

TEXT: The radiation of a molecular beam in a coherent field is investigated. The molecules are in a mixed energy state with two levels. The beam on entering a cavity will continue radiating when the cavity is tuned to the transition frequency $h\nu_{12} = E_1 - E_2$, although the number of molecules in the upper and lower level is the same. The function of the two-level system is $\psi = a\psi_1 + b\psi_2$; $a^2 + b^2 = 1$, a(+) depends on ν, E and $(\nu - \nu_0)$. μ is the dipole moment and E the resonance field strength of the frequency ν, ν_0, ν_0 is the frequency of the molecular transition. Such a state can be obtained with an ammonia beam leaving the cavity of a normal molecular generator; it is saturated, i. e. the populations of the

Card 1/3

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two levels are equal, is inactive and can emit only non-coherent oscillations, spontaneously. Entering a second cavity the molecules will emit electromagnetic oscillations of the frequency of the first resonator and this frequency is completely independent of the resonance frequency of the second cavity. The apparatus consisted of 3 test cavities the first of which worked as an ordinary molecular generator and an NH_3 spectroscope. The radiation frequency in the second cavity was highly monochromatic and coincided with that of the first cavity to an accuracy of 10^{-12}. The radiation power in the second and third cavity was measured in dependence on the tuning of the first and second, on the voltage V of the grading system, and on the ammonia gas pressure in the source. When the radiation power in the second cavity vanishes the beam passing through the third cavity does not radiate, but shows an intense absorption line. At certain V and p values the beam leaving the first cavity also absorbs energy even in the second cavity. In this case the population of the energy levels during the flight through the second cavity is a periodic function of time and of the number of active molecules in the beam. On detuning the first cavity by $\Delta\nu_1 = \pm 4$ Mc/sec

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when the shf field in it vanishes, beats between the frequency of the "molecular sound" and the natural frequency of the second cavity are found in the latter. The beat frequency is 3-4 kc/sec. Further detuning of the first cavity causes cessation of the "molecular sound". There are 3 figures and 5 references: 1 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: R. H. Dicke, Phys. Rev., 93, 99, 1954; Rev. Sci. Instr., 26, 915, 1955; W. H. Higa, Rev. Sci. Instr., 28, 726, 1957; W. H. Wells, J. Appl. Phys., 29, 714, 1958; N. Sher, IRE Nat. Conv. Rec., 4199, 78, 1960.

SUBMITTED: December 30, 1961

Card 3/3

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

BASOV, N.G., GRAYEVSKIY, A.N., STRAKHOVSKIY, G.M., TATARENKOV, V.M.

"Radiation of molecules being in a mixed energy state."

Report submitted to the Third Intl. Conf on Quantum Electronics
Paris, France 11-15 Feb 1963

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

ACCESSION NR: AP4017044 S/0141/63/006/006/1273/1274

AUTHORS: Strakhovskiy, G. M.; Tatarenkov, V. M.

TITLE: Simple thermostat for a maser cavity

SOURCE: IVUZ. Radiofizika, v. 6, no. 6, 1963, 1273-1274

TOPIC TAGS: maser, maser cavity, maser cavity temperature, maser cavity thermostat, maser stability, maser frequency stability

ABSTRACT: A thermostat has been developed to maintain a maser cavity constant to 10^{-2}--10^{-3} deg. It consists essentially of a generator with bridge feedback which becomes positive whenever the cavity temperature is too low. When the temperature is high the feedback is negative and the generator stops operating. The cavity can therefore never be overheated. The bridge is temperature sensitive because one of its arms is made of copper and the other three of manganin. The thermostat was used to stabilize an ammonia maser.

Card 1/3

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the stability of which remained unaffected by replacing the invar cavity by a brass one. The thermostat is claimed to be superior to other types and to maintain the temperature constant within 10^{-3} deg. Orig. art. has: 3 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 01Jun63 DATE ACQ: 18Mar64 ENCL: 01

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

ACCESSION NR: AP4017046 S/0141/63/006/006/1279/1280

AUTHORS: Strakhovskiy, G. M.; Tatarenkov, V. M.; Tumanov, O. A.

TITLE: Ammonia maser with two cavities in series (3, 2 line)

SOURCE: IVUZ. Radiofizika, v. 6, no. 6, 1963, 1279-1280

TOPIC TAGS: maser, ammonia maser, two cavity maser, maser frequency characteristic, maser power characteristic, 3, 3 line maser, 3,2 line maser

ABSTRACT: In order to eliminate some of the frequency instabilities which are still present in an ammonia maser with two cavities in tandem (F. H. Reder and C. I. Bickart, Rev. Sci. Instr., v. 31, 1164, 1960) tuned to the (3, 3) line, the authors investigated the feasibility of a similar maser using the (3.2) line. The ammonia source (channel 10 mm long and 1 mm in diameter), the state separator, and the two cavities were arranged on one line, with the cavities spaced

Card 1/2

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10 mm apart. Cavities with identical Q (≈8000) were used in the E_{010} mode. With a sufficiently high sorter voltage, (20 kV), the curve of the second-cavity power vs. first-cavity detuning exhibited the typical dip at zero detuning characteristic of the two-cavity maser with the 3, 3 ammonia line, thus demonstrating that the 3,2 line can be used in two-cavity masers. Orig. art. has: 2 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 01Jun63 DATE ACQ: 18Mar64 ENCL: 00

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

ACCESSION NR: AT3012116 S/2504/63/021/000/0068/0106

AUTHOR: Strakhovskiy, G. M.

TITLE: Investigation of the characteristics of molecular generators ($N^{14}H_3$ line J = 3, K = 3)

SOURCE: AN SSSR. Fizicheskiy institut. Trudy*, v. 21, 1963, 68-106

TOPIC TAGS: ammonia maser, maser frequency variation, maser characteristics, maser relative stability, maser ammonia pressure effect, opposing beam maser

ABSTRACT: It is pointed out that the theoretical and experimental investigations of the dependence of a maser frequency on different apparatus parameters is far from complete and that there are not enough detailed experimental characteristics of the maser that have been published to permit a quantitative comparison between theory and experiment. This article is devoted to an experimental investigation of maser characteristics and problems connected with the construction of a maser of high relative stability. The data on masers already in operation are published and an experimental maser for the

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ammonia (3,3) line described along with the equipment used to measure the frequency. The dependence of the maser frequency and relative power on the natural frequency of the cavity, the voltage on the quadrupole capacitor (or on the ring-type selector system), and on the ammonia pressure in the source was measured. The dependence of the frequency and relative power with two opposing beams on the ammonia pressure in the molecular beam source was also investigated. The resultant characteristics are theoretically explained on the basis of several published papers. The possible relative frequency stability of the (3,3) line maser with one beam over four hours of operation was found to be 10^{-11} The natural frequency of the maser cavity can be tuned to the spectral line within $\sim 5 \times 10^{-9}$ by means of an oscilloscope and within $\sim 5 \times 10^{-10}$ by equalizing the minima (or maxima) of the maser frequency vs. source ammonia pressure. The spectral line width of the stimulated emission was measured for several types of molecular beam sources and the optimal conditions determined. In general the maximum line width can be obtained at

Card 2/3

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maximum amplitude. Orig. art. has: 26 figures, 14 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

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L 05134-65 EEC(b)-2/EPR/EWG(j)/EEC(k)-2/EPA(w)-2/EWA(h)/EWA(k)/EWP(k)/EWT(1)/EEC(t)/FBD/EPA(bb)-2/T/EWA(m)-2 Pf-4/Pl-4/Pl-4/Pn-4/Po-4/Ps-4/Pab-10/Peb IJP(c) JHB/GG/WG/WW

ACCESSION NR: AP5002331 S/0141/64/007/005/0992/0994

AUTHORS: Strakhovskiy, G. M.; Tatarenkov, V. M.

TITLE: New method for tuning the frequency of a maser by modulating the high vacuum in the generator vacuum chamber

SOURCE: IVUZ. Radiofizika, v. 7, no. 5, 1964, 992-994

TOPIC TAGS: maser, maser tuning, maser accuracy, ammonia maser

ABSTRACT: The authors have observed that the dependence of a maser frequency on the pressure in the vacuum chamber can be used to tune the maser frequency. This method is particularly convenient for tuning a two-beam generator, since it does not disturb the symmetry of the beams. Tests have shown that the generator frequency is very close to being linear in the pressure down to 1×10^{-5} mm Hg, with deviations from linearity observed at lower pressures. The accuracy with which the maser could be tuned to the J = 3, K = 2 line of

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$N^{14}H_3$ was 5×10^{-10}. It is suggested that an improvement in the short-time stability of the generator and the use of a simple electronic control system for the modulation of the vacuum will improve this accuracy. It is claimed that the method is superior to that of magnetic-field modulation, which cannot be used for a resonator made of invar. Orig. art. has: 3 figures and 1 formula.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

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L 23601-65 EWG(j)/EWA(k)/FSD/EWT(1)/EEC(k)-2/T/EDC(t)/EEC(b)-2/EWP(k)/EWA(h)/EWA(m)-2 Pn-4/Po-4/Pf-4/Pi-4/Peb/Pl-4 IJP(c) WG

ACCESSION NR: AP5002332 S/0141/64/007/005/0994/0995

AUTHOR: Strakhovskiy, G. M.; Tatarenkov, V. M.

TITLE: New method of generating a beam of slow molecules for maser application

SOURCE: IVUZ. Radiofizika, v. 7, no. 5, 1964, 994-995

TOPIC TAGS: maser, molecular generator

ABSTRACT: A method of generating a beam of slow molecules by means of a conventional curved sorting system is discussed. In this method the system plays a dual role in separating the molecules according to both energy state and velocity. All active molecules with velocities below a certain value flow through the sorting system toward the resonator. High-velocity molecules and molecules in the low-energy state pass out of the sorting system and do not reach the resonator. A ring- or helix-type sorting system can be easily converted into a curved system. With the sorting system curved 30°, a signal of induced radiation was received on a conventional maser

Card 1/2

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receiver at a signal-to-noise ratio of 3. A quartz-crystal generator supplied the pumping signal. Orig. art. has: 1 formula. [KM]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

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L 23061-65 EWA(k)/EWT(1)/EEC(k)-2/T/EEC(b)-2/EWP(k)/EWA(m)-2 Pf-4/Pl-4/Pl-4/Po-4 IJP(c) JHB/WG

ACCESSION NR: AP5001858 S/0056/64/047/006/2314/2316

AUTHOR: Basov, N. G.; Nikitin, A. I.; Strakhovskiy, G.M.; Uspenskiy, A. V.

TITLE: The possibility of determining relaxation rates by means of a hydrogen-atom beam maser

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 6, 1964, 2314-2316

TOPIC TAGS: maser, hydrogen beam maser, relaxation rate

ABSTRACT: The authors present some characteristics obtained at FIAN with a hydrogen atom beam maser (λ = 21 cm) and show how a study of these characteristics can be used to deduce the relaxation rates of various processes that lead to the loss of active atoms (escape of active particles from the vessel, wall losses, relaxation due to magnetic field inhomogeneities, and spin reorientation upon collision or two hydrogen atoms). An oscillogram of the time dependence of the power of stimulated emission of an underexcited maser under the influence of a light pulse yielded for the FIAN equipment a relaxation rate γ_0 = 3 sec^{-1}. Information on the relaxation rate was also obtained

Card 1/2

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by plotting the output power of an operating maser against the intensity of the active-atom beam. This yields the constant characterizing the relaxation due to collision of two hydrogen atoms with spin exchange. The value obtained was in the range (1—6) x 10^{-10} cm^3/sec/particle, which agreed with published data. A value of 2 sec^{-1}, obtained for γ_0 by plotting the resonance curve of the cavity and using a formula for the frequency pulling of the maser by the generator is in good agreement with the value obtained from the stimulated-emission oscillogram. Orig. art. has: 3 figures and 1 formula. [02]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR).

SUBMITTED: 10Jul64 ENCL: 00 SUB CODE: EC, EM

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L 52321-65 EEC(b)-2/EWG(r)/EEC(k)-2/EWA(h)/EWA(k)/EWP(k)/EWT(1)/EEC(t)/FBD/T/EWA(m)-2 Pf-4/Pi-4/Pl-4/Pm-4/Pn-4/Po-4/Peb IJP(c) WW

ACCESSION NR: AP5013667 UR/0386/65/001/001/0022/0026

60
59
B

AUTHOR: Mukhamedgaliyeva, A. F.; Orayevskiy, A. N.; Strakhovskiy, G. M.

TITLE: Maser with two series resonators and a "molecular ring" amplifier

25

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 1, 1965, 22-26

TOPIC TAGS: maser, two beam maser, molecular ringing, maser line width

ABSTRACT: A maser was investigated with two cascaded cavities and with two colliding beams, one cavity acting as generator and the other as amplifier, with an aim of checking the possibility of obtaining in this system a narrower spectral emission line than in a single-cavity maser. A schematic diagram is shown in Fig. 1 of the Enclosure. The system dimensions were ℓ = 23 mm (length of each cavity) and L = 140 mm (distance between cavity ends). The beam of molecules, first polarized in one of the resonators, excites in the second resonator oscillations of the same frequency as in the first ("molecular ringing"). This "ringing" is amplified by the opposing intense beam of molecules. To attain approximate equality of the incoming and outgoing particles the intensity of the beam

Card 1/4

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amplifying the "molecular ringing" is made several times larger than the intensity of the beam producing the generation. The line narrowing in such a system can be estimated from the decrease of the slope of the plot of the change of generation frequency vs. resonator frequency deviation. The expected line narrowing should have been 10—12, but since the losses of beam intensity in the gap between cavities were not fully compensated for, a much smaller narrowing was obtained. The test results are shown in Fig. 2 of the Enclosure and indicate that as the cavity in which generation takes place is detuned the system frequency does not vary continuously over the entire detuning range. The jumps in frequency can be attributed to the fact that in this system there should be, besides a principal maximum at the molecular-transition frequency, two secondary maxima differing in frequency by approximately 1/T from the principal maximum. If the line has such a shape, then jumps of frequency and amplitudes should be observed in the generation mode. Orig. art. has: 2 figures. [02]

ASSOCIATION: Fizicheskiy institut Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR)

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ACCESSION NR: AP5013667

ENCLOSURE: 01

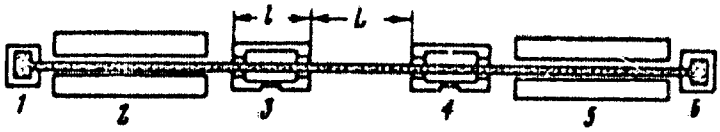

Fig. 1. Schematic diagram of two-cavity two-beam maser:

1, 6 - Molecular beam sources; 2,5 - sorting systems; 3, 4 - cavities.

Card 3/4

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ACCESSION NR: AP5013667

ENCLOSURE: 02

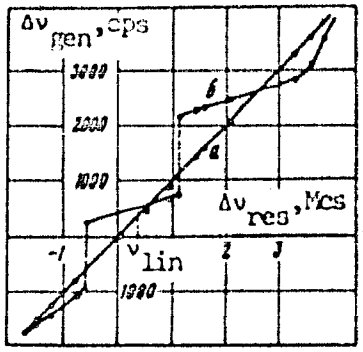

Fig. 2. Dependence of the generation frequency on the cavity frequency deviation: a - in a single-cavity maser, b- in a cavity with a "molecular ringing" amplifier.

Card 4/4

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L 17675-65 EWA(k)/FSS/EWT(1)/EEC(k)-2/T/EWA(k)/EWA(m)-2/EWA(h) IJP(c) WG

ACCESSION NR: AP5021731 UR/0386/65/002/002/0077/0079

AUTHOR: Veselago, V. G.; Orayevskiy, A. N.; Strakhovskiy, G. M.; Tatarenkov, V. M.

TITLE: A new method for tuning a maser

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 2, 1965, 77-79

TOPIC TAGS: maser, resonator, microwave generator

ABSTRACT: The maser with two series connected resonators has previously been studied in detail by several authors. It has been shown that the amplitude and phase of the field in the second resonator are given by the expression:

$$E \sim \frac{N}{Z_{eff}} \langle P(\tau_1, \tau_2) \rangle e^{-i(\omega_n - \omega_1)T}, \quad (1)$$

where P is an independent function of the intensity of the field in the first resonator and of the transit time through the first (τ_1) and second (τ_2) resonators; N is the number of molecules in a unit of volume; Z_{eff} is the effective impedance of

Card 1/3

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L 00753-66

ACCESSION NR: AP5021731

the resonator with respect to the molecules contained in it; ω_1 is the frequency of oscillations in the first resonator; and ω_{12} is the molecular transition frequency. The symbol <> indicates averaging with respect to the velocities of the molecules, T is the transit time of the molecules between resonators. It is evident from this approximation that when $\omega_{21} \neq \omega_1$, the phase difference between the oscillations in the first and second resonators depends on the distance l between them. When $\omega_{21} = \omega_1$, the phase difference is zero for any l. Thus the frequency of the maser ω_1 can be tuned exactly to the transition frequency ω_{21}. Actually, if the distance between the resonators is varied by the quantity Δl, the phase of the oscillations in the second resonator is changed by the quantity

$$\Delta\Psi = (\omega_1 - \omega_{21})\frac{\Delta l}{\bar{v}}, \qquad (2)$$

where $\bar{v}$ is the velocity of the molecular beam. If it is assumed that Δl is very nearly 10 cm, $\bar{v} = 5\cdot10^4$ cm/sec, and $\omega_1 - \omega_{21} = 10^{-10}\omega_{21}$, then $\Delta\phi = 2\cdot10^{-4}$, which corresponds to a change in the phase angle by approximately 0.01°. For practical purposes, the accuracy in phase measurements limits determination of emission frequency to an accuracy of 10^{-10}. It is also possible to use modulation of the distance between the resonators according to the law $\Delta l = \Delta l_0 \cos\Omega t$. This causes phase

Card 2/3

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ACCESSION NR: AP5021731

modulation of the field in the second resonator due to periodic variation in the transit time $T = l(t)/\bar{v}$. The amplitude of the phase modulation is found from expression (2). Periodic modulation of the distance between the resonators may be used to record small changes in the phase difference between the oscillations in the first and second resonators since the method of synchronous detection can be used in this case. The advantage of this system for tuning is that it eliminates the effect of the traveling wave on the tuned frequency. If the spectral line used for emission consists of a single component, frequency ω_1 will coincide with the transition frequency ω_{21}. Orig. art. has: 2 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 27May65 ENCL: 00 SUB CODE: EC

NO REF SOV: 004 OTHER: 001

Card 3/3

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 10396-66 EWT(1)/EEC(k)-2/EPF(n)-2/EWA(h) WW/AT

ACC NR: AP5026900 SOURCE CODE: UR/0109/65/010/010/1809/1813

AUTHOR: Basov, N. G.; Strakhovskiy, G. M.; Nikitin, A. I.; Nikitina, T. F.; Tatarenkov, V. M.; Uspenskiy, A. V.

ORG: Institute of Physics, AN SSSR (Fizicheskiy institut AN SSSR)

TITLE: Quantum generator with hydrogen-atom beam

SOURCE: Radiotekhnika i elektronika, v. 10, no. 10, 1965, 1809-1813

TOPIC TAGS: quantum generator, atomic hydrogen ~~quantum generator~~

ABSTRACT: Construction of two atomic-hydrogen quantum generators (QG) designed after H. M. Goldenberg, D. Kleppner, and N. F. Ramsay (Phys. Rev. Let., 1960, 5, 8, 361; and Phys. Rev., 1962, 126, 2, 603) is reported. Atomic hydrogen from gas-discharge source 1 passes (10^{11} -10^{13} particles per sec) through diaphragm 2 and is focused by magnet 3. The sectionalized vacuum

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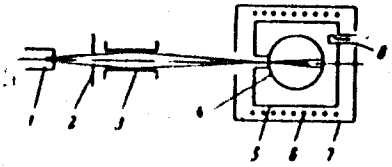
L 10396-66

ACC NR: AP5026900



system uses ordinary N5SM pumps in the first sections and an ion-sorption titanium pump in the last section to achieve a vacuum of 10^{-7} torr. Other parts of QG are: 4 - quartz teflon-lined bulb; 5 - resonator; 6 - solenoid for building an axial magnetic field; 7 - magnetic shield ; 8 - coupling loop. A 0.01—0.02-sec pumping pulse, at a frequency corresponding to λ = 21 cm transition, produced a post-radiation for 0.2—0.5 sec. The total estimated and measured relaxation constant was about 2 per sec, which corresponds to a lifetime of 0.5 sec. Data on frequency stability and shift is also given. "The authors wish to thank A. M. Prokhorov and A. N. Orayevskiy for discussing the results and valuable advice; and L. P. Yelkina, G. A. Yelkin, A. N. Ponomarev, A. A. Ul'yanov, L. M. Zak, N. A. Begun, and O. S. Lysogorov for their assistance in the project." Orig. art. has: 5 figures and 6 formulas.

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 52322-65 EWG(r)/EEC(k)-2/EEC(b)-2/EWA(h)/EWP(k)/EWA(k)/EWT(1)/EEC(t)/FBD/T/
EWA(m)-2 Pf-4/Pi-4/Pl-4/Pn-4/Pn-4/Po-4/Peb IJP(c) WG

ACCESSION NR: AP5012604 UR/0051/65/018/005/0785/0791

AUTHOR: Morozov, V. N.; Orayevskiy, A. N.; Strakhovskiy, G. M.; Tatarenkov, V. M.

TITLE: Hyperfine structure of the inversion spectrum of $N^{15}H_3$ (line J = 3, K = 3)

SOURCE: Optika i spektroskopiya, v. 18, no. 5, 1965, 785-791

52
B

TOPIC TAGS: ammonia maser, hyperfine structure, inversion spectrum

ABSTRACT: In view of its importance in the construction of highly stable masers, the authors investigated theoretically and experimentally the hyperfine structure of the inversion spectrum of the ammonia molecule $N^{15}H_3$ (J = 3, K = 3) in the electronic ground state and vibrational states. The Hamiltonian of the molecule is determined in the Born-Oppenheimer approximation and its eigenvalues are calculated, from which the wave functions and the frequencies and relative intensities of the transitions are determined. The fine structure was also determined experimentally using as a spectroscope an underexcited maser with $N^{15}H_3$ beam. A block diagram of the set-up and a brief description of the experiment are given. The satellites observed on the photograph of the spectrum agreed within the limits of errors with the calculated transition frequencies. Orig. art. has: 3 figures, 11 formulas, and 2 tables. [02]

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ACCESSION NR: AP5012604

ASSOCIATION: none

SUBMITTED: 16Apr64 ENCL: 00 SUB CODE: OP, EC

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 4454-66 EWT(1)/EWP(m)/T IJP(c) GW

ACC NR: AP5018607

UR/0053/65/086/003/0421/0432
530.12:531.51

32
B

AUTHOR: Strakhovskiy, G. M.; Uspenskiy, A. V.

TITLE: Gravitational radiation and the prospect of its experimental discovery

SOURCE: Uspekhi fizicheskikh nauk, v. 86, no. 3, 1965, 421-432

TOPIC TAGS: gravitation field, gravitation wave, stellar evolution, cosmogony

ABSTRACT: The author shows that improvements in experimental techniques in general, and relatively recent development of statistical methods for distinguishing weak signals from noise, make the detection gravitational waves more realistic than in the past. The various sources of gravitational radiation are discussed (binary stars, asymmetrical collapse of stars, neutron stars, high-frequency gravitational radiation of extraterrestrial origin, and possible terrestrial sources such as rotating masses or explosions). The requirements that gravitational-wave detectors must satisfy are listed, and the similarity between high-precision electromagnetic-field measurements and gravitational measurements is pointed out. Particular attention is paid to a method involving the use of a pair of test masses (earth and satellite, earth and star, two planets, two bodies in the laboratory, and an extended single rigid body), which can be used for this purpose in analogy with an electric quadrupole. The possible sensitivity of such a system is analyzed and it is concluded that the method is feasible. The instrumental limitations on the sensitivity of the method are dis-

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ACC NR: AP5018607

cussed, and the upper bound of the density of gravitational radiation of extra-terrestrial origin is estimated. Orig. art. has: 1 figure, 20 formulas, and 2 tables.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: GP, AA

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 16979-66 FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(h) IJP(c) WG

ACC NR: AP5022807 SOURCE CODE: UR/0141/65/008/004/0824/0826

AUTHOR: Mukhamedgaliyeva, A. F.; Strakhovskiy, G. M.

ORG: Institute of Physics, AN SSSR (Fizicheskiy institut AN SSSR)

TITLE: Investigation of a maser with two series resonators on two opposite beams

SOURCE: IVUZ. Radiofizika, v. 8, no. 4, 1965, 824-826

TOPIC TAGS: maser, two beam maser, two resonator maser

ABSTRACT: The distance between two maser resonators, each 23-mm long, was 140 mm. Such an experimental system was mutually synchronizable within 4 kc. A plot of generation frequency vs. one-resonator natural frequency revealed a considerable jump of the synchronous frequency at one point; this fact did not correspond to theoretical analysis. It was also found that the "molecular ringing" (F. H. Reder et al., Rev. Sc. Instr., 31, 1164, 1960) increased with shortening the length of the first resonator or with decreasing its Q-factor; the ringing intensity of a 23-mm-long resonator was roughly 5 times as high as that of an 80-mm-long resonator; also, the ringing intensity doubled when the Q-factor was changed from 10000 to 5000. Orig. art. has: 2 figures and 2 formulas.

SUB CODE: 20 / SUBM DATE: 26Mar65 / ORIG REF: 004 / OTH REF: 001

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APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"

"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 23322-66 EWA(h)/EEC(k)-2/EWT(1)/EWT(m)/EWP(k)/FBD/T/EWP(t) IJP(c) WO/JD

ACC NR: AT6009315 SOURCE CODE: UR/2504/65/031/000/0139/0177

AUTHORS: Basov, N. G.; Strakhovskiy, G. M.; Nikitin, A. I.; Nikitina, T. F.; Tatarenkov, V. M.; Uspenskiy, A. V.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Problems of construction and investigation of the operation of a hydrogen-atom-beam maser

SOURCE: AN SSSR. Fizicheskiy institut. Trudy, v. 31, 1965. Kvantovaya radiofizika (Quantum radio physics), 139-177

TOPIC TAGS: maser theory, gaseous state maser, hydrogen, maser, quantum generator, excited state, stimulated emission

ABSTRACT: The authors review the hitherto published work on the theory and construction of hydrogen-beam masers and discuss the construction, choice of optimal parameters, and preliminary operating results of a maser using the transition ($F = 1$, $m_F = 0$) -- ($F = 0$,

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ACC NR: AT6009315

$m_F = 0$) at 1420.405 Mcs. Two installations of different construction are described. The operation of the maser in the underexcited mode is investigated. A procedure for determining the lifetimes of the excited atoms in the storage bulb are described. The apparatus was operated with an axial resonator magnetic field of 100 -- 300 mOe. The dependence of the amplitude and frequency of generation on the various parameters was investigated and it was found that the greatest contribution to the maser instability is due to the instability of the supplementary magnetic field and the detuning of the resonator as a result of thermal expansion. Methods of overcoming these difficulties are discussed. The section headings are: Introduction. I. Construction and adjustment of hydrogen-beam maser. 1. Operating principle of hydrogen-beam maser. 2. Vacuum system. 3. Atomic-beam sources. 4. State sorting and atomic-beam focusing. 5. Detection of hydrogen-atom beam. Methods of adjusting the apparatus. 6. Bulb for accumulation of atomic hydrogen. 7. Cavity resonator. 8. Radiation receiver for 1420 Mcs frequency. II. Investigation of operation of hydrogen-beam maser (preliminary results). 1. Investigation of stimulated emission of atomic hydrogen at 1420.4 Mcs.

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2. Characteristics of hydrogen-beam maser. Conclusions. The authors thank A. M. Prokhorov and A. N. Oraevskiy for a discussion of the results and valuable advice, and L. P. Yelkina, G. A. Yelkin, A. N. Ponomarev, A. A. Ul'yanov, L. M. Zak, N. A. Begun, and O. S. Lysogorov for help with the work. Orig. art. has: 28 figures and 69 formulas.

SUB CODE: 20/ ORIG REF: 021/ OTH REF: 034 / SUBM DATE: none

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 28449-66 FBD/EWT(1)/EWT(m)/EEC(k)-2/T/EWP(t)/ETI/EWP(k) IJP(c) WO/JD

ACC NR: AP6018703 SOURCE CODE: UR/0386/66/003/011/0441/0443

AUTHOR: Basov, N. G.; Zakharov, Yu. P.; Nikitina, T. F.; Popov, Yu. M.; Strakhovskiy, G. M.; Tatarenkov, V. M.; Khvoshchev, A. N.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Gallium arsenide laser operating at room temperature

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pisma v redaktsiyu. Prilozheniye, v. 3, no. 11, 1966, 441-443

TOPIC TAGS: gallium arsenide, semiconductor laser, pn junction, junction diode, laser radiation spectrum

ABSTRACT: The authors investigated the performance of semiconductor lasers based on diffusion p-n junctions operating at 300K. The diodes were excited either with a pulse generator (current up to 4000 amp, pulse duration 20 nsec) or with a generator with discharge capacitor and mechanical discharge with current up to 1500 amp and pulse duration 30-60 nsec. The diode emission had at low currents a broad spectrum that narrowed down gradually from 300 to 110 Å with increasing current. At a threshold current density that varied from diode to diode (10^3 - 5×10^3 amp/cm^2), a single generation line was produced at ~9000 Å, which is of longer wavelength than the maximum of the spontaneous emission spectrum. With increase in current, additional lines appear in the spectrum, corresponding to different resonator modes and the

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L 28449-66

ACC NR: AP6018703

generation wavelength increases. Measurement of the diode emission directivity pattern yielded for the width of the luminescent region a value of 4 μ. The directivity pattern in a plane parallel to the p-n junction shows a pronounced multilobe interference character, with average half-width 8°. Orig. art. has: 2 figures and 1 formula. [02]

SUB CODE: 20/ SUBM DATE: 02Apr66/ ORIG REF: 002/ OTH REF: 002/ ATD PRESS: 5006

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 32209-66 FBD/EWT(1)/EEC(k)-2/T/EWP(k) IJP(c) WG

ACC NR: AP6020791 SOURCE CODE: UR/0386/66/003/012/0468/0471

AUTHOR: Basov, N. G.; Orayevskiy, A. N.; Strakhovskiy, G. M.; Uspenskiy, A. V.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Two-cavity laser as high-resolution spectroscope

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 12, 1966, 468-471

TOPIC TAGS: laser application, laser radiation spectrum, molecular spectroscopy, receiver resolution, hyperfine structure

ABSTRACT: The authors show that in a laser it is possible to resolve spectral components within the limits of a homogeneously broadened line, so that a spectroscope based on the use of such a laser can have a resolution limit determined by the width connected with the monochromaticity and stability of the radiation source. The spectroscope consists of a previously-described laser with two cavities in tandem (Pis'ma ZhETF v. 2, 77, 1965). Modulation of the distance between the two cavities normally modulates the signal in the second cavity, but if the signal frequency coincides exactly with the peak of the spectral line, then the

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distance modulation does not cause phase modulation. Since the position of the line peak changes with the magnitude of the signal in the first cavity, it is possible, by measuring the generation frequency at which the phase of the second cavity does not depend on the modulation of the distance between cavities, to obtain at different signal values as many independent equations as there are hyperfine structure components in the line. Simultaneous solution of these equations determines the positions of the hyperfine components. A sample calculation is given for a line with two components, and it is shown that for cavities 10 cm long spaced 10 cm apart, a mean beam velocity 6 x 10 cm/sec, a modulation frequency 10 cps, and a detection time of 1 sec it is possible to resolve spectral components separated by several cps. Orig. art. has: 2 formulas.

SUB CODE: 20/ SUBM DATE: 09Apr66/ ORIG REF: 002/ OTH REF: 001

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 44600-66 EWT(1)/EWT(m)/EWP(k)-2/T/EWP(k)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6030977 SOURCE CODE: UR/0181/66/008/009/2789/2791

AUTHOR: Kogan, L. M.; Libov, L. D.; Nasledov, D. N.; Nikitina, T. F.; Strakhovskiy, G. M.; Tsarenkov, B. V.

ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR); Physics Institute im. P. N. Lebedev AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

TITLE: Certain properties of GaAs laser diodes with an epitaxial p-n junction at room temperature

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2789-2791

TOPIC TAGS: solid state laser, semiconductor laser, gallium arsenide, laser, epitaxial diode, infrared laser, PN JUNCTION, EPITAXIAL GROWING

ABSTRACT: In an experimental investigation of epitaxial p-n GaAs junctions, tellurium-doped n-type and zinc-doped p-type GaAs was used. The electron concentration in the n-type GaAs was 5.5×10^{17}—2.4×10^{18} cm^{-3}; the hole concentration in the p-type GaAs was 1.5×10^{18}—2.4×10^{19} cm^{-3}. The specimens were oriented along the (100) plane and the epitaxial p-n junction was prepared from the liquid phase by a method described elsewhere (H. Nelson, RCA Rev., 24, 603, 1963). The dislocation density near the p-n junction in the epitaxial layers did not exceed that in the wafer and was 10^4 cm^{-2}. The Fabry-Perot cavity was formed by the cleaved (110) surfaces, and the electrical

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ACC NR: AP6030977

contacts were made of indium. The residual resistance of a diode with an area of 10^{-3} cm^2 was less than 0.1 ohm. Laser action at room temperature was achieved with 30-nanosec current pulses. An FEU-22 photomultiplier recorded the optical output. The threshold currents were determined from the dependence of intensity on current. The p-type GaAs specimens with hole concentrations of 2.4×10^{19} cm^{-3} and a mobility of 50 $cm^2/v \cdot sec$ lased at 9000Å at threshold currents of 1.5×10^5 amp/cm^2. Investigations were also made of specimens in which the epitaxial layer, doped with zinc and partly compensated by lead, was grown on a tellurium-doped GaAs substrate with an electron concentration of 9.5×10^{17} cm^{-3} and a mobility of 2400 $cm^2/v \cdot sec$. These lased at room temperature at 9010 Å at currents of 3.8×10^5 amp/cm^2 and at 8910 Å at currents of 4.7×10^5 amp/cm^2 and up. The power per pass of p-GaAs lasers was 30 watts with 700-amp currents and 18-nanosec pulses; that of n-GaAs lasers was 10 watts with 300-amp currents and 30-nanosec pulses. Orig. art. has: 1 figure. [YK]

SUB CODE: 20/ SUBM DATE: 25Mar66/ ORIG REF: 001/ OTH REF: 003/ ATD PRESS: 5078

Card 2/2

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 41759-66 FBD/EWT(1)/EEC(k)-2/T/EWT(k) IJi(c) WD
ACC NR: AP6011915 SOURCE CODE: UR/0141/66/009/002/0302/0307

AUTHOR: Mukhamedgaliyeva, A. F.; Orayevskiy, A. N.; Strakhovskiy, G. M.

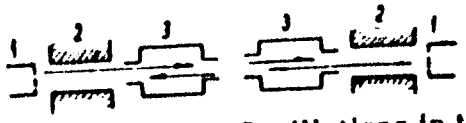
ORG: Institute of Physics, AN SSSR (Fizicheskiy institut AN SSSR)

TITLE: Investigation of a maser with "molecular-ringing" amplifier

SOURCE: IVUZ. Radiofizika, v. 9, no. 2, 1966, 302-307

TOPIC TAGS: maser, molecular generator, molecular ringing, LINE NARROWING

ABSTRACT: An experimental investigation is reported of a maser (see figure) with two series resonators and two opposing beams; one resonator functioned as a generator, the other, as an amplifier. In the figure: 1 - sources of molecular beams, 2 - sorting systems, 3 - resonators. Oscillations in the above maser were calculated for far-from-saturation operating conditions; the generation frequency was assumed to be close to the molecular-transition frequency. In the experimental model, the resonator length was 2.3 cm, distance between the resonators, 16 cm. Experimental curves of:



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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

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ACC NR: AP6011915

generation frequency and amplitude vs. tuning of the generating resonator (at pressures 0.3, 1, 1.5 torr in the amplifying-beam source); generation frequency vs. tuning of the amplifying resonator (at the same pressures) are shown. The experimental characteristics have two frequency and amplitude jumps which are explained by two additional side maxima frequency-spaced from the principal maximum by $1.2\,T^{-1}$; the generation between the jumps takes place on different peaks of the Ramsey curve. It is found that the line width in the above system is 1/5 to 1/4 that of a single-resonator maser. Orig. art. has: 4 figures and 3 formulas.

SUB CODE: 20 / SUBM DATE: 10Aug65 / ORIG REF: 004 / OTH REF: 003

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

L 29198-66 FBD/EWT(1)/EEC(k)-2/EWP(k) IJP(c) WG

ACC NR: AP6008289 SOURCE CODE: UR/0109/66/011/003/0519/0525

AUTHOR: Strakhovskiy, G. M.; Tatarenkov, V. M.; Shumyatskiy, P. S.

ORG: none

TITLE: Effect of external constant electric and magnetic fields applied to an outside-the-resonator active-molecule beam upon the maser frequency

SOURCE: Radiotekhnika i elektronika, v. 11, no. 3, 1966, 519-525

TOPIC TAGS: maser, gaseous state maser

ABSTRACT: This is a further development of an authors' earlier work on the same subject (ZhETF, 1963, v. 45, no. 6(12), 1768). This article reports in detail an investigation of the effect of external nonuniform electric and magnetic fields upon the maser frequency at J = 3, K = 3 and J = 3, K = 2 lines of $N^{14}H_3$. In an experimental maser (see figure), a beam of active molecules from source 1

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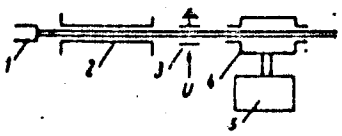

passes through sorting system 2, capacitor (creating a nonuniform electric field) 3, and enters resonator 4; receiver 5 registers the effect. In some experiments, capacitor 3 was replaced with an electromagnet. It was found that weak electric and magnetic fields acting upon the molecular beam before the resonator can materailly affect the frequency stability of the maser (curves supplied); this is particularly pronounced in the case of the complicated unresolved J = 3, K = 3 ammonia line where the frequency shift may reach 1000 cps. A much weaker effect on the J = 3, K = 2 line can be used for tuning the maser for the top of the radiation line; this method of tuning has the advantage over the conventional Zeeman-modulation method as it does not limit the choice of resonator material and is as sensitive. Orig. art. has: 6 figures and 3 formulas.

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ACC NR: AP6014252 SOURCE CODE: UR/0109/66/011/005/0943/0943

53
B

AUTHOR: Mukhamedgaliyeva, A. F.; Strakhovskiy, G. M.

ORG: none

TITLE: Effect of the coupling between resonator and vacuum-envelope upon the maser-frequency stability

SOURCE: Radiotekhnika i elektronika, v. 11, no. 5, 1966, 943

TOPIC TAGS: maser, molecular generator, molecular ringing, FREQUENCY STABILITY

ABSTRACT: Experiments have shown that the vacuum envelope of a maser acts as a second (external) resonator and causes a "molecular ringing" affecting the maser frequency stability. This short note suggests that, in order to ensure high frequency stability, the maser must be equippped with two series-connected resonators, of which the first resonator must have no side ports. In the single-resonator case, the envelope Q-factor must be kept low by using suitable materials and coatings. Orig. art. has: no figures, no formulas, no tables.

SUB CODE: 20 / SUBM DATE: 11Aug65 / ORIG REF: 001 / OTH REF: 001

Card 1/1 UDC: 621.378.33

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"

"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

ACC NR: AP6032018 SOURCE CODE: UR/0386/66/004/006/0208/0210

AUTHOR: Kogan, L. M.; Libov, L. D.; Nasledov, D. N.; Nikitina, T. F.; Orayevskiy, I. N.; Strakhovskiy, G. M.; Sungurova, O. A.; Tsarenkov, B. V.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Continuous coherent radiation of epitaxial diodes of GaAs at 77K

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 6, 1966, 208-210

TOPIC TAGS: gallium arsenide, epitaxial growing, pn junction, semiconductor laser, emission spectrum, recombination emission

ABSTRACT: The authors report continuous generation from a GaAs semiconductor laser with epitaxial pn junction operating with the medium at 77K. The junction was produced by liquid epitaxy by the method of H. Nelson (RCA Rev. v. 24, 603, 1963). The epitaxial layer was doped with tellurium to a density ~5 x 10^{18} cm^{-3}. A Fabry-Perot type resonator was produced by cleavage along the (110) plane. Emission values of the spectra of the same diode, obtained at different values of the exciting current, in pulsed or continuous operation, show that the maximum of the recombination spectrum shifts toward shorter wavelengths with increasing current; this shift is due to the "dispersal" of the Fermi quasilevels with increasing pump energy, and also to the shift to the long-wave section of the spectrum in the continuous mode, relative to

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the spectrum in the pulsed mode, connected with the constant heating of the active region in the continuous case. This difference between the spectra in the two modes is larger for small currents and decreases on approaching the threshold current. The latter effect is connected with the presence of deep electronic levels with very low state density. Coherent radiation in the continuous mode occurs at a current of 250 ma (612 a/cm^2). The narrow spectral line appearing in this case corresponds most probably to the non-axial "annular" type of resonator oscillations. At 410 ma (1020 a/cm^2), a new system of coherent lines appears, which can be interpreted as corresponding to axial modes of the cavity. The total emission power of the diode for which the spectra are presented is 5 mW at the appearance of the first coherent line and 70 mW at a current 1.5 a. Orig. art. has: 1 figure. [02]

SUB CODE: 20/ SUBM DATE: 13Jun66/ OTH REF: 002/ ATD PRESS: 5084

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

ACC NR: AP6033286 SOURCE CODE: UR/0141/66/009/005/0923/0931

AUTHOR: Nikitin, A. I.; Strakhovskiy, G. M.

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

TITLE: Characteristics of a hydrogen beam maser 25

SOURCE: IVUZ. Radiofizika, v. 9, no. 5, 1966, 923-931 27

TOPIC TAGS: maser, hydrogen maser, hydrogen atom maser, hydrogen atom beam maser, HYDROGEN

ABSTRACT: A number of characteristics of a hydrogen beam maser were measured and the results discussed. Generated signal strength plotted against the intensity of the atom beam showed a sinusoidal pattern with a maximum at about 2/3 shutter opening, which is close to the theoretical calculated by D. Kleppner and others (Phys. Rev., 126, 1962, 603). Signal strength as a function of current in the focusing electromagnet showed an asymptotically flattening pattern, which was highest for a medium beam density. Higher beam densities brought about a slump at about half the maximum signal strength. This slump was caused by the character of the dependence of the effective capture angle on the field strength at the pole. The downbend of the capture angle at higher

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field strength coincided with the slump in the signal strength at higher currents. The signal strength as a function of the axial magnetic field strength of the resonator solenoid showed a very steep beginning with a maximum at 2×10^{-5} oe and a relatively slow drop at low (up to 6×10^{-5} oe) field strength range. The curve is the result of different factors whose effects become pronounced at different magnitudes of the field strength. The relaxation rate of atoms, signal strength at high field strength range of the solenoid, and the dependence of frequency on the beam density under various resonance conditions, field inhomogeneity, and field strength are discussed at some length. Orig. art. has: 14 figures and 5 formulas.

SUB CODE: 20/ SUBM DATE: 18Jan66/ ORIG REF: 005/ OTH REF: 002

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

ACC NR: AP6033263 SOURCE CODE: UR/0109/66/011/010/1881/1885

AUTHOR: Nikitin, A. I.; Strakhovskiy, G. M.

ORG: none

TITLE: Transient processes in an H-atom-beam maser

SOURCE: Radiotekhnika i elektronika, v. 11, no. 10, 1966, 1881-1885

TOPIC TAGS: maser, gaseous state maser

ABSTRACT: The establishment of amplitude and phase of oscillations in an H-maser was investigated by means of an ENO-1 oscillograph. With stronger beams, the maser dead time was shorter and amplitude fluctuation was observed. The atom lifetime was 0.85 sec; average amplitude-fluctuation period, 1.8 sec. Oscillograms of the maser-starting process, with an overexcitation parameter β = 10, 7, 5.4, and 2.7 are shown, as is an oscillogram of oscillation collapse

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upon turning-off the beam. The phase establishment was studied by photographing the Lissajous ring on the oscillograph screen by a moving-picture camera (8 frames per sec). Phase fluctuation dies out during the period of amplitude build-up; amplitude fluctuation lasts longer. "The authors wish to thank A. V. Uspenskiy for his comments and discussion." Orig. art. has: 5 figures and 9 formulas.

SUB CODE: 20 / SUBM DATE: 29Jan66 / ORIG REF: 003 / OTH REF: 002

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

STRAKHOVSKIY, Viktor, inzh.

Concerning the efficiency of the operation of feed pumps. Teploenergetika 8 no.1:87-89 Ja '61. (MIRA 14:4)

1. Chekhoslovatskaya Sotsialisticheskaya Respublika. (Electric power plants) (Pumping machinery)

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"

"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

Evaluation of the action of hexachloran and DDT in combatting grain gnats. [illegible] *Nauch.-Issledovatel. Inst.* [illegible] *Zharit. S.S.S.R.* 1953, No. 1, [illegible] 1955, No. 4100.—Dusting of [illegible] with 20 kg [illegible] of 1:1 mixt. of 5% DDT and 12% hexachloran resulted in [illegible] the time of emergence reduced the [illegible] with gnats. Dusting with DDT alone was not as effective as with the mixt. Application of [illegible] kg DDT [illegible] hexachloran into the soil was ineffective. Dusting of the seed with a mixt. of both was equally ineffective.

M. Hasch

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

STRAKHUN, S.S., inzh.; MOGILEVSKIY, I.A., inzh.

Medium-sized trawlers. Sudostroenie 23 no.12:1-3 D '57. (MIRA 11:2)

(Trawls and trawling)

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

S/137/61/000/012/111/149
A006/A101

AUTHOR: Strakopytov, V.I.

TITLE: Using high-capacity units with radioactive isotopes for the quality control of thick weld joints

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 12, 1961, 66-67, abstract 12E412 (V sb. "Radioakt. izotopy i yadern. izlucheniya v nar. kh-ve SSSR, v. 3", Moscow, Gostoptekhizdat, 1961, 41 - 43)

TEXT: Information is given on experiences made with the use of high-capacity units with radio-active isotopes for the quality control of weld joints in thick-walled (45 - 155 mm) welded containers, which are intended for high-power boiler drums, hydraulic-press accumulator stations, etc. at the Barnaul Boiler Plant. Inspection was made with two ГУП - Co -50 (GUP-So-50) units with a radio-active Co^{60} source of 50 g-equiv Ra intensity. The inspecting department located in one of the shop spans, is a box, 5.5 m deep, 5 m wide and 15 m long with reinforced-concrete lined floor and walls. On the box floor there are 4 mechanized tilters, 2 of which are equipped with built-in electric motors. The GUP-So-50 units move on a narrow-gage track along the box. The tilter and the units can be

Card 1/2

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controlled directly from the box or from a control point on the box top. The weld joints of the container, which is mounted in the box on rolls, are divided into 300 mm long sections. Rubber badges with the X-ray film and Pb-screens are fixed onto the welds from the internal side of the container. Pb signs are marked into the badges which correspond to the number of the section inspected. Stepped defect-meters are fixed on the external side of the welds. One GUP-So-50 unit is mounted at the beginning of the longitudinal seam, the other one in the middle of the weld joint. The inspection time of each weld is selected from curves plotted specially for each metal thickness. When a button is pressed on the control desk, the ampoules are shifted from the storage to the operating container. After inspection of two sections simultaneously, the ampoules are automatically displaced to the following 2 sections. For the inspection of circumferential seams, the ampoules are simultaneously mounted on 2 circumferential seams. After inspecting 2 sections, the container is turned with the aid of the tilter, and the two following sections of the circumferential weld are inspected. Within a month > 1,500 running meters of seams, 40-155 mm thick, are being inspected in the box. It is pointed out that good results have been obtained with the combined use of ultrasonic control and gamma-inspection. V. Tarisova

[Abstracter's note: Complete translation]

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

STRAKOS, O.
HAJEK, F.

Stepping up time standards on the basis of sector output standards of the Ministry of Heavy Machine Manufacture and Technical Management Research Institute of the Machinery Industry, p. 101.

STROJIRENSKA VYROBA, Praha, Czechoslovakia, Vol. 7, no. 3, 1959

Monthly list of East European Accessions (EEAI), LC, Vol. 8, no. 7, July 1959
uncla.

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

5(3) SOV/79-29-6-26/72

AUTHORS: Ludriniyetse, L., Vanag, G., Strakov, A., Beyland, O.

TITLE: Sulfonation of β-Diketones (Sul'firovaniye β-diketonov). VI. Derivatives of Indandione-1,3-sulfonic-2-acid (VI. Proizvodnyye indandion-1,3-sul'fo-2-kisloty)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 6, pp 1893 - 1897 (USSR)

ABSTRACT: There are no data available in publications regarding the derivatives of the keto group of the sulfonic acids of the ketones and aldehydes (Ref 1). Although the dioxime of the indandione-1,3-sulfonic-2-acid obtained from its dipotassium salt and hydroxylamine hydrochloride in the presence of K_2CO_3 was described (Ref 2), the authors were not able to attain the same results, neither with the disodium nor with the dipotassium salt of this acid. On addition of alcohol the initial product, and not the dioxime described, precipitated.

Card 1/3

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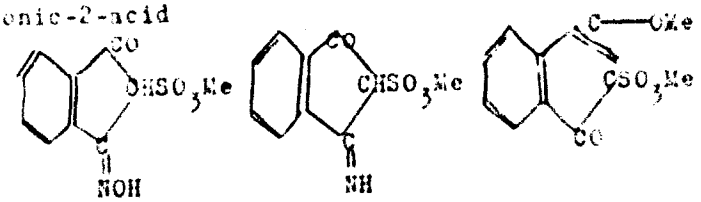
Sulfonation of β-Diketones. VI. Derivatives of Indandione- SOV/79-29-6-26/72
1,3-sulfonic-2-acid



(I) (II) (III)

The experiments under review indicated that the oxime (I) is readily formed on boiling of the sodium salt of the indandione-1,3-sulfonic-2-acid in glacial acetic with hydroxylamine-hydrochloride, even without anhydrous sodium acetate. It is hardly soluble in water and is transformed by bromination to give the 2,2-dibromo-indandione-1,3. The oxygen of the keto group of the sodium salt of the acid mentioned is substituted by the imino group with compound (II) being formed in the $Me-NH_4$. When treating compound (II) with the alcoholic solution of sodium hydroxide or sodium ethylate compound (IV) (Me-Na) was formed, the bipolar structure of which was confirmed by the ultraviolet absorption spectra. A number of derivatives of the indandione-1,3-sulfonic-2-acid was thus synthesized (the oxime, semicarba-

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Sulfonation of β-diketones. VI. Derivatives of Indandione-1,3-sulfonic-2-acid

SOV/79-29-6-26/72

zone, imine and phenyl-imine in the form of the sodium, ammonium or aniline salts). Bromination of the sodium salt of the oxime of the above-mentioned acid and of the ammonium salt of the imine of the same acid (V) yielded 2,2-dibromo-indandione-1,3. Phosphorus pentachloride forms with the sodium salt of the acid the 2-chloro-indandione-1,3-sulfonic-2-acid-chloride. Its bromination results in 2-chloro-2-bromo-indandione-1,3. When boiling the sulfo-chloride with alcohols SO_2 develops, which is transformed into 2,2-dichloro-indandione-1,3. There are 1 figure and 11 references, 6 of which are Soviet.

ASSOCIATION: Latviyskiy gosudarstvennyy universitet (Latvian State University)

SUBMITTED: May 19, 1958

Card 3/3

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"

"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

STRAKOV, A.Ya.; GUDRINIYETSE, E.Yu.; IYEVIN'SH, A.F.; VANAG, G.Ya.

Sulfonation of β diketones. Part 12: Sulfonation of 2-phenyl-1, 3-indandione. Zhur. ob. khim. 30 no.12:3967-3972 D '60. (MIRA 13:12)

1. Rizhskiy politekhnicheskiy institut.
(Indandione) (Sulfonation)

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"

"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

STRAKOV, A. Ya.; VANAG, G. Ya.; GUDRINETSE, E. Yu.

Sulfonation of β-diketones. Part 14: Derivatives of 2-(p-sulfophenyl)- 1, 3,-indandione. Zhur. ob. khim. 31 no.3:906-911 Mr '61. (MIRA 14:3)

1. Rizhskiy politekhnicheskiy institut.
(Indandione) (Sulfonation)

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"

"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

STRAKS, A.Ya.; NEYLANDS, O.Ya. [Neilands, O.]; GUDRINIYETS, E.Yu. [Gudriniece, E.]; VANAG, G.Ya. [Vanags, G.], akademik

Sulfonation of 2-veratryl- and 2-piperonyl-1,3-indandiones. Dokl. AN SSSR 141 no.2:374-377 N '61. (MIRA 14:11)

1. Rizhskiy politekhnicheskiy institut. 2. AN Latviyskoy SSR (for Vanag).

(Indandione) (Sulfonation)

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"

"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

STRAKOV, Vladimir, inz.

Emergency section signaling by mercaptan. [illegible] 5 no.10:3[illegible] C '63.

1. Zavod mechanizace a automatizace, Ostrava.

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"

"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

BASTAR, Miloslav; STRAKOVA, A.; SYKORA, J.

Examination of the use of hemagglutination and hemagglutination for the direct diagnosis of fowl pest in dead fowl. Veterinarni medicina 7 no.2:93-106 '62.

1. Statni veterinarni ustav Praha, Krajske veterinarni zarizeni Jihoceskeho kraje, vysetrovaci stanice Ceske Budejovice.

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"APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2

ANDRASINA, J.; ROVENSKÁKOVÁ, V.; Technická spolupráce: SIANINOVA, B.; STRAKOVA, B.

On changes in the level of iron and copper in the serum after their intravenous administration in patients with peptic ulcer and other chronic diseases. Bratisl. lek. listy 44 no.4:205-214 31 Ag '64.

1. Vedecké laboratorium pri Chirurgickej klinike lek. fak. Univerzity P.J. Safarika v Kosiciach (veduci prof. MUDr. Jan Knazovicky).

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653420017-2"