USSR

SMIRNOV, N. I., MOGILEVSKIY, L. YU.

UDC 621.396.232.1

"Allowable Number of Simultaneously Active Addresses of a Multiaddress System with Code Separation"

Moscow, Radiotekhnika, Vol 26, No 10, 1971, pp 13-24

Abstract: The dependence of the allowable number of simultaneously active information sources of a multiaddress system on the mutual correlation characteristics of complex systems with different levels of fluctuation noise at the receiver input was investigated. Coherent and incoherent operating conditions with a passive and active interval are considered.

The relations were found for the allowable number of simultaneously active addresses, $N_{allow.addr}$, for different operating conditions as a function of the length of the sequences n and the required quality of information transmission determined by the given error probability, P_{error}. The real statistical characteristics of the correlation functions of linear recurrent sequences were considered when deriving these relations. It was demonstrated that the values of $N_{allow.addr.}$ under incoherent operating conditions with passive and active

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SHIRMOV, N. I., et al., Radiotekhnika, Vol 26, No 10, 1971, pp 13-24

intervals differ little from $N_{allow.addr.}$ under coherent conditions with a passive interval. In the case of coherent operating conditions with an active interval by comparison with the remaining versions, it is possible to obtain a gain in the ratio of $N_{allow.addr.}$ by approximately two times. For low fluctuation noise, that is, for large k, determination of $N_{allow.addr.}$ from the derived equation gives a good estimate of the operation of a coherent system both for active and passive intervals, and a coherent system, for a passive interval. Inasmuch as a system with a passive interval requires half as much energy and has a simpler transmitter and receiver and half as many quasiorthogonal signals, in the case of incoherent operating conditions, the passive interval is preferable since the difference in $N_{allow.addr.}$ for systems with an active interval and a passive interval is insignificant. It is possible to assign the allowable transmission rate $R = F/b$ for various values of the signal base B as a function of its spectral width F. Therefore, it is necessary to use signals with a base of no less than 2,047 to insure simultaneous satisfactory operation on one frequency band in a multiaddress asynchronous communications system of several tens (nearly 100) addresses. The existing radio elements (microcircuits) permit a transmission rate of 5000 baud in each of the N_{addr}.

2/2

USSR UDC: 621.391.519.2

SMIRNOV, N. I., KISELEV, V. A.

"Statistical Characteristics of the Resulting Process at the Output of a Correlation Receiver"

Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR (Works of Educational Institutes of Communications. Ministry of Communications of the USSR), 1970, vyp. 49, pp 24-29 (from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A78)

Translation: The authors give the results of "Minsk-22" computer modeling of the resultant process acting on the resolution circuit as a consequence of the simultaneous presence of overshoots of various functions of mutual correlation of complex signals formed on the basis of linear sequences. The degree to which the distribution of the process approaches normal distribution as the number of sequences and their durations increase is found. Resumé.

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USSR

UDC 621.391:519.27

SMIRNOV, N. I.

"Information Transmission System with Correlation Signal Processing"

Tr. Mosk. elektrotekhn. in-ta svyazi (Works of Moscow Electrotechnical Communications Institute), 1969, vyp. 1, pp 52-56 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A41)

Translation: This article contains a brief investigation of the possibilities of simultaneous and independent transmission of various types of information over a common frequency trunk of a TV-relay. A binary information transmission system with phase manipulation of two quasiorthogonal M-sequences is proposed as one such possibility. The transmitter contains two shift registers and an M-sequence commutator; analogous shift registers exist in the receiver. It is demonstrated that the quality of the TV reception should not become worse in this case. The probability of error in the information transmission system is no worse than 10^{-3}-10^{-5}. The expected values of other system parameters are presented. There are three illustrations and a five-entry bibliography.

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1/2 010 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--EVALUATING THE STABILITY OF POLYMER DISPERSIONS -U-

AUTHOR-(03)-VERKHOLANTSEV, V.V., SUTAREVA, L.V., SMIRNOV, N.I.

COUNTRY OF INFO--USSR

SOURCE--LAKOKRASOCH. MATER. IKH. PRIMEN. 1970, (1), 20-1

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--RUBBER CHEMICAL, LATEX, CALCULATION, CHEMICAL STABILITY/(U)OP10 LATEX EMULSIFIER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0428 STEP NO--UR/0303/70/000/001/0020/0021

CIRC ACCESSION NO--AP0119364

UNCLASSIFIED

2/2 010 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119364

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TWO METHODS USED FOR THE EVALUATION OF DP-10 LATEX EMULSIFIER STABILITY VIZ., (A) BY CALCG. THE HEIGHT OF THE POTENTIAL BARRIER (U) FROM CURVES PLOTTED FOR THE POTENTIAL ENERGY OF PARTICLE INTERACTION VS. DISTANCE BETWEEN THE PARTICLES, AND (B) BY MEASURING THE CRIT. DISTANCE BETWEEN THE PARTICLES DURING DESTABILIZATION, WERE CRIT. EXAMD. A PLOT OF U EQUALS F(DELTA) (WHERE DELTA EQUALS DELTA SUB0 MINUS DELTA SUBCR-DELTA SUB0 AND DELTA SUB0 AND DELTA SUBCR ARE THE CALCD. AND THE CRIT. THICKNESS OF A LIQ. INTERLAYER) IN THE RANGE UNDER STUDY GAVE A CRUVE WHICH WAS EXTRAPOLATED TO DELTA EQUALS 0 WHEN U EQUALS 0 AND CORRESPONDED TO AN UNSTABLE SOL. THE CORRELATION BETWEEN U AND DELTA PERMITTED THE CALCN. OF U BY INTERPOLATION (FROM THE EXPTL. DETD. SOL CONCN. CORRESPONDING TO ITS COAGULATION).

UNCLASSIFIED

Acc. Nr. AP0053744 Abstracting Service: CHEMICAL ABST. 6-20 Ref. Code 4R0080

111870q Synthetic latexes. X. Determination of optimum conditions for the emulsion polymerization of styrene. Makovetskaya, K. N.; Beresnev, V. N.; Smirnov, N. I. [Leningrad. Tekhnol. Inst. im. Lensoveta, Leningrad, USSR]. *Zh. Prikl. Khim. (Leningrad)* 1970, 43(1), 126-31 (Russ). Math. anal. showed that the max. polymn. rate to obtain stable latex in the redox-initiated emulsion polymn. of styrene could be obtained with NaO_2SCH_2OH–cumene hydroperoxide ratio 1:0.634 or 3:2. A secondary process apparently decreased the concn. of the peroxide radicals. The assumption was confirmed that the processes leading to destruction of the radicals and macroradicals during the polymn. increases the stability of the latex. DBJR

VI

CB 7

REEL/FRAME 19830805

1/2 023 UNCLASSIFIED PROCESSING DATE--090CT70

TITLE--AMPLITUDE MANIPULATED SIGNAL RECEPTION IN POWERFUL AM NOISE -U-

AUTHOR-(02)-SILIN, A.V., SHIRNOV, N.M.

COUNTRY OF INFO--USSR

SOURCE--KIEV, IZVESTIYA VUZOV SSSR RADIOELEKTRONIKA, VOL 13, NO 2, 1970, PP 242-245

DATE PUBLISHED--------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., NAVIGATION

TOPIC TAGS--TELEGRAPH SIGNAL, SIGNAL RECEPTION, ELECTROMAGNETIC NOISE, RADIO RECEIVER, AMPLITUDE MODULATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1991/1456 STEP NO--UR/0452/70/013/002/0242/0245

CIRC ACCESSION NO--AP0110946

UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0110946

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS PAPER IS CONCERNED WITH PROTECTION OF THE RADIO RECEIVER FROM NOISE OF A LEVEL EXCEEDING THAT OF THE DESIRED SIGNAL. THE RECEIVER IS ASSUMED TO HAVE AN AMPLITUDE MANIPULATED SIGNAL OF A PARTICULAR CARRIER FREQUENCY IN AMPLITUDE MODULATED NOISE AT ITS INPUT. THE AMPLITUDE OF THE NOISE ENVELOPE IS A RANDOM PROCESS WITH A SPECTRUM LIMITED BY THE FREQUENCY. THE FREQUENCY DIFFERENCE OF CARRIER AND NOISE SIGNALS IS SOMEWHAT HIGHER THAN THE UPPER FREQUENCY OF THE SIGNAL ENVELOPE SPECTRUM. IT IS ALSO ASSUMED THAT THE SIGNAL AND NOISE FREQUENCIES AT THE RECEIVER END OF THE COMMUNICATION CHANNEL ARE KNOWN. THE INITIAL TELEGRAPH SIGNAL IS TO BE DETECTED AT THE RECEIVER OUTPUT. A RECEIVER TO COPE WITH THIS PROBLEM WAS DESIGNED AND TESTED BY THE AUTHORS. THE BLOCK DIAGRAM OF THIS RECIEVER IS GIVEN. AS THE AM NOISE, THEY USED A 120 KHZ OSCILLATION WITH A SUPPRESSED CARRIER; THEY USED A NOISE PROCESS WITH LIMITED SPECTRUM AS THE MODULATING FUNCTION. THE TELEGRAPH SIGNAL WAS SUPPLIED BY KEYING. THE AUTHORS REPORT THAT THE NOISE HAD PRACTICALLY NO EFFECT ON THE RECEPTION. THEY CONCLUDE WITH THE ASSERTION THAT THE RECEIVER CAN ALSO BE USED IN MULTIPLEXING.

UNCLASSIFIED

USSR

SILIN, A. V., et al., Izvestiya VUZov SSSR-Radioelektronika, Vol 13, No 2, 1970, pp 242-245

limited spectrum as the modulating function. The telegraph signal was supplied by keying. The authors report that the noise had practically no effect on the reception. They conclude with the assertion that the receiver can also be used in multiplexing.

1/2 023 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--COMPUTER DESIGN OF ION EXCHANGE PROCESSES -U-

AUTHOR-(04)-VOLZHINSKIY, A.I., SMIRNOV, N.N., ROMANKOV, P.G., VIKTOROV, V.K.

COUNTRY OF INFO--USSR

SOURCE--TEOR. OSN. KHIM. TEKHNOL. 1970, 4(1), 118-22

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL REACTION KINETICS, MAGNESIUM, CALCIUM, ION EXCHANGE, SORPTION, COMPUTER APPLICATION, MODEL, ION EXCHANGE RESIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/1085 STEP NO--UR/0455/70/004/001/0118/0122

CIRC ACCESSION NO--AP0104483

UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0104483

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SORPTION KINETICS OF MG PRIME2 POSITIVE OR CA PRIME2 POSITIVE IONS BY A SINGLE BEAD OF CATION EXCHANGE RESIN WERE TREATED BY A. I. VOLZHINSKII (1969) AND THE BEHAVIOR OF A COLUMN OF RESIN ONLY ONE BEAD DEEP IS SIMILAR. THE TREATMENT IS EXTENDED TO CALC. THE ELUTION CURVE FOR A COLUMN PACKED WITH THE RESIN, BY NUMERICAL INTEGRATION OF THE EQUATION DOWN THE COLUMN. THE WAY IN WHICH A COMPUTER PROGRAM WAS WRITTEN TO PERFORM THE INTEGRATION, APPROX. BY ITERATIVE SUMMATION, IS SHOWN IN A FLOW DIAGRAM. COMPARISON WITH EXPT. SHOWS A SMALL DISCREPANCY AT HIGH LEVELS OF SORPTION OF MG AND CA, WHICH IS EXPLAINED BY INTERNAL RESISTANCE TO DIFFUSION; AN IMPROVED VERSION OF THE KINETIC EQUATION FOR THE ELEMENTARY LAYER OF RESIN IS SUGGESTED.

UNCLASSIFIED

USSR

UDC: 621.372.852

BOCHAROV, Ye. V., SMIRNOV, N. N.

"A Simple Three-Pole Circuit of RLC-Phase Inverter"

Moscow, Radiotekhnika, Vol 25, No [illegible], 1970, pp 106-107

Abstract: The advantage of the suggested RLC phase inverter is that it can operate with a relatively large capacitive load. It differs from the bridge-type phase inverter that it has three terminals.

This study aimed to analyze the performance of such a phase inverter with due consideration for losses in the inductive and resistive loads. It was shown that the modulus of the transfer constant of the RLC phase inverter is equal to unity independently of the value of phase shift for certain conditions of the input signal. If the phase shift does not exceed 100°, then the scale of the phase inverter remains sufficiently linear with the use of variable resistor type A as a regulating element. The destabilizing effect of the capacitive load is reduced by increasing the capacitance of the phase inverter.

The fundamental relations characterizing the RLC phase inverter were derived, which assist in selection of proper elements of the circuit and calculation of the basic parameters of the inverter.

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EQUIPMENT
Aeronautical

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USSR

UDC: None

ABRAMOV, Ye. I., BROTSKIY, A. N., BURTSEV, V. A., ZATOLOKIN, A. S., ZUBKOVA, T. I., and SMIRNOV, N. P.

"Hydraulic Damper for an Aircraft Flutter Model"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 27, 1971, p 119, No (11)351001

Abstract: The body of this device contains a rotor with a controlling valve and a charge-compensating device. By having this device in the form of an elastic membrane which converts into a sealing ring between the body and a hood filled with a transparent material, the size and weight of the damper can be reduced. A cross sectional drawing of the device is shown.

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UNCLASSIFIED PROCESSING DATE--16OCT70

1/3 . 023

TITLE--RELATIONSHIP BETWEEN THE DEFORMATION FORCE AND MOVEMENT OF ATMOSPHERIC CENTERS OF ACTION -U-

AUTHOR-(03)-MAKSIMOV, I.V., SARUKHANYAN, E.I., SMIRNOV, N.P.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, DOKLADY AKADEMII NAUK SSSR, VOL. 190, NO. 5, PP. 1095-1097

DATE PUBLISHED-------70

SUBJECT AREAS--ATMOSPHERIC SCIENCES

TOPIC TAGS--LOW PRESSURE, HIGH PRESSURE, POLAR AREA, EQUATOR, GEOGRAPHIC LATITUDE, VECTOR, ROTATIONAL FLOW

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0020/70/190/005/1095/1097

PROXY REEL/FRAME--1991/0972

CIRC ACCESSION NO--AT0110677

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--16OCT70

2/3 . 023
CIRC ACCESSION NO--AT0110677
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POTENTIAL OF THE DEFORMAITON FORCE ARISING AS A RESULT OF MOTION OF THE EARTH'S POLES WAS INVESTIGATED. THE HORIZONTAL COMPONENT OF THIS FORCE WILL REPRESENT THE VECTOR SUM OF TWO COMPONENTS, ONE DIRECTED ALONG THE MERIDAN AND THE OTHER ALONG THE PARALLEL. THE MERIDIONAL COMPONENT OF THE DEFORMATION FORCE HAS MAXIMUM AND OPPOSITELY DIRECTED VALUES AT THE POLES AND AT THE EQUATOR AND IS EQUAL TO ZERO AT 45DEGREESN ADN S. THE LATITUDE COMPONENT OF THE FORCE IS MAXIMUM AND OPPOSITELY DIRECTED AT THE POLES AND IS EQUAL TO ZERO AT THE EQUATOR. AS A RESULT, THE TOTAL HORIZONTAL COMPONENT OF THE DEFORMATION FORCE HAS A COMPLEX NATURE OF CHANGE WITH LATITUDE. AT THE POLES THE VALUES OF THE FORCE VECTOR ARE MAXIMUMA AND WITH COUNTERCLOCKWISE ROTATION THE END OF THE VECTOR DESCRIBES A CIRCLE. IN THE LATITUDINAL ZONE 55-75DEGREES, AS A RESULT OF PREDOMINANCE OF THE LATITUDE COMPONENT, THE TRAJECTORY DESCRIBED BY THE END OF THE FORCE VECTOR IS AN ELLIPSE WHICH EXTENDS MORE AND MORE ALONG THE PARALLEL WITH APPROACH TO LATITUDE 45DEGREES. AT 45DEGREES THE FORCE CHANGES ONLY IN A ZONAL DIRECTION. THE MERIDIONAL COMPONENT OF THE FORCE IS ABSENT. SOUTHWARD IT APPEAR AGAIN, BUT NOW IT IS DIRECTED IN THE OPPOSITE DIRECTION. AT 30DEGREES THE END OF THE TOTAL FORCE VECTOR, NOW ROTATING CLOCKWISE, AGAIN DESCRIBES A CIRCLE, BUT WITH HALF THE RADIUS OF THE CIRCLE AT THE POLE. WITH APPROACH TO THE EQUATOR THIS CIRCLE BECOMES CLOSER TO AN ELLIPSE, ELONGATED ALONG THE MERIDIAN, AND AT THE EQUATOR THE HORIZONTAL COMPONENT OF THE DEFORMATION FORCE AGAIN ATTAINS MAXIMUM VALUES, CHANGING ONLY IN A MERIDIONAL DIRECTION.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--16OCT70

3/3 . 023

CIRC ACCESSION NO--AT0110677

ABSTRACT/EXTRACT--THE HORIZONTAL COMPONENT OF THE DEFORMATION FORCE IS COMMENSURABLE WITH THE FORCES WHICH OPERATE IN THE HORIZONTAL PLAE AND THEREFORE ASSUMES PARTICULAR IMPORTANCE IN STUDIES OF THE DYNAMICS OF ATMOSPHERIC PROCESSES. SEVEN YEAR SERIES OF DATA ON THE LATITUDE ANDLONGITUDE OF THE ICELANDIC LOW AND THE AZORES HIGH WERE PROCESSED BY HARMONIC ANALYSIS FOR THE YEARS 1945-1951, A PERIOD OF CONSIDERABLE AMPLITUDE OF POLAR OSCILLATIONS. THE AMPLITUDES AND PHASES OF 14 MONTH VARIATIONS OF LATITUDE AND LONGITUDE OF THE CENTERS OF ACTION WERE USED IN COMPUTING AND CONSTRUCTION THE ELLIPSES OF 14 MONTH DISPLACEMENTS OF THE CENTER OF THIS HIGH AND LOW. DURING THE CONSIDERED PERIOD THE 14 MONTH MOVEMENTS OF THESE CENTERS OCCURRED IN ELLIPSES ORIENTED FROM SW TO NE IN OPPOSITE DIRECTIONS. THIS RESULT IS IN FULL AGREEMENT WITH THE NATURE OF THE SPATIAL CHANGE OF THE HORIZONTAL COMPONENT OF THE DEFORMATION FORCE. THE AMPLITUDE OF THE 14 MONTH DISPLACEMENTS OF THE CENTER OF THE ICELANDIC LOW IN LATITUDE WAS APPROXIMATELY 1.5 TIMES GREATER THAN THE CORRESPONDING MOVEMENTS OF THE AZORES HIGH. IT CAN THEREFORE BE CONCLUDED THAT THE 14 MONTH MOVEMENTS OF THE ATMOSPHERIC CENTERS OF THE ATMOSPHERIC CENTERS OF ACTION IN THE ATLANTIC ZONE IN THE NORTHERN HEMISPHERE OCCUR UNDER THE INFLUENCE OF THE HORIZONTAL COMPONENT OF THE DEFORMATION FORCE. FACILITY: INSTITUTE OF THE BIOLOGY OF INTERIOR WATERS.

UNCLASSIFIED

1/2 021 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--PRESSURE, POLAR TIDE, AND ITS INFLUENCE ON THE ICE CONDITIONS OF THE ARCTIC SEAS -U-

AUTHOR-(03)-GUDKOVICH, Z.M., SARUKHANYAN, E.I., SMIRNOV, N.P.

COUNTRY OF INFO--USSR

SOURCE--OKEANOLOGIYA, 1970, VOL 10, NR 3, PP 426-437

DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, ATMOSPHERIC SCIENCES

TOPIC TAGS--PRESSURE, ATMOSPHERE, POLAR AREA, OCEAN, CYCLONE, ICE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1867 STEP NO--UR/0213/70/010/003/0426/0437

CIRC ACCESSION NO--AP0129227

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--23OCT7C

2/2 021

CIRC ACCESSION NO--AP0129227

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSIDERATION IS BEING GIVEN TO THE FOURTEEN MONTH VARIATION OF ATMOSPHERIC PRESSURE OVER THE ARCTIC CAUSED BY THE NUTATION OF THE EARTH'S POLES. TO EXPLAIN THE SPECIFIC FEATURES OF THE VARIATION A HYPOTHESIS IS ADVANCED ACCORDING TO WHICH THE NUTATIONAL VARIATIONS OF ATMOSPHERIC PRESSURE ARE DUE TO THE SUPERPOSITION OF SECONDARY WAVES UPON THE PRIMARY CIRCUMPOLAR PRESSURE WAVE. THESE WAVES ARISE OWING TO THE INCLUENCE OF THE PRESSURE POLAR TIDE ON THE INTENSITY OF CYCLONIC ACTIVITY IN THE ZONES OF CYCLOGENESIS. THE ANALYSIS OF THE NUTATIONAL FLUCTUATIONS OF THE PRESSURE GRADIENTS IN THE THREE MAIN REGIONS OF THE ARCTIC MADE IT POSSIBLE TO EXPLAIN THE PECULIARITIES OF THE PREVIOUSLY ESTABLISHED RELATION OF ICE AND HYDROLOGICAL CONDITIONS TO THE MOVEMENT OF THE EARTH'S POLE, AS WELL AS TO FIND OUT A NUMBER OF NEW REGULARITIES OF THIS PHENOMENON.

FACILITY: ARKTICHESKIY I ANTARKTICHESKIY NAUCHNO-ISSLED. INSTITUT.

UNCLASSIFIED

1/2 010 UNCLASSIFIED PROCESSING DATE--11DEC70

TITLE--COMPARATIVE ANALYSIS OF THE HYDROCARBON COMPOSITION OF FRACTIONS OF HYDROGENATED GASOLINE OF THERMOCRACKING AND STRAIGHT RUN GASOLINE -U-

AUTHOR-(05)-RISOV, B.YA., MAMAYEVA, K.N., SMIRNOV, N.P., BERG, G.A., KOLBIN, M.A.

COUNTRY OF INFO--USSR

SOURCE--NEFTEPERERAB, NEFTEKHIM. (MOSCOW) 1970, (6), 59

DATE PUBLISHED--------70

SUBJECT AREAS--PROPULSION AND FUELS

TOPIC TAGS--CHEMICAL ANALYSIS, HYDROCARBON, GASOLINE, THERMOCRACKING, HYDROGENATION, PETROLEUM CATALYTIC REFORMING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605060/C04 STEP NO--UR/0318/70/000/006/0059/0059

CIRC ACCESSION NO--AP0144347

UNCLASSIFIED

2/2 010 UNCLASSIFIED PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AP0144347

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COMPN. OF THE TITLE FRACTIONS WAS SIMILAR ENOUGH TO PERMIT THE USE OF THE DEEP HYDROFINED FRACTION OF THERMOCRACKING AS STOCK FOR CATALYTIC REFORMING. FACILITY: NOVO-UFIMSK. NPZ, USSR.

UNCLASSIFIED

1/3 021 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--THE POLE TIDE IN THE HIGH LATITUDES ATMOSPHERE -U-

AUTHOR-(03)-GUDKOVICH, Z.M., SARUKHANYAN, E.I., SMIRNOV, N.P.

COUNTRY OF INFO--USSR, ARCTIC OCEAN

SOURCE--MOSCOW, DOKLADY AKADEMII NAUK SSSR, VOL. 190, NO. 4, 1970, PP. 954-957

DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, ATMOSPHERIC SCIENCES

TOPIC TAGS--GEOGRAPHIC LATITUDE, SEA ICE, SEA LEVEL, PRESSURE, ATMOSPHERE, ARCTIC CLIMATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1991/0966 STEP NO--UR/0020/70/190/004/0954/0957

CIRC ACCESSION NO--AT0110675

UNCLASSIFIED

2/3 021 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AT0110675

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PRESENCE OF A NUTATIONALLY INDUCED POLE TIDE IN THE EARTH'S ATMOSPHERE HAS BEEN DEMONSTRATED AND THEREFORE ANY STUDY OF VARIATIONS OF THE ICE CONTENT IN ARCTIC SEAS MUST TAKE INTO ACCOUNT THE EXISTENCE OF 14 MONTH PRESSURE VARIATIONS WHICH OCCUR IN THE HIGH LATITUDES WHICH ARE ASSOCIATED WITH MOTION OF THE POLES. SEA LEVEL PRESSURE WAS ANALYZED FOR THOSE LATITUDES USING MEAN MONTHLY PRESSURE MAPS. THE AUTHORS PROCESSED 151 SERIES OF MEAN MONTHLY PRESSURES FOR THE 14 YEARS 1951-1964. THE PERIODOGRAM ANALYSIS METHOD WAS USED. THIS MADE IT POSSIBLE TO DETERMINE THE PHASES AND AMPLITUDES OF 14 MONTH PRESSURE VARIATIONS FOR ALL SELECTED POINTS. ANALYSIS OF THE CONSTRUCTED ISOAMPLITUDES MAP INDICATES THAT IN THE ARCTIC ATMOSPHERE THERE ARE APPRECIABLE 14 MONTH PRESSURE FLUCTUATIONS WHOSE AMPLITUDES ATTAIN 1.5 MB, WHICH IS ABOUT 50PERCENT OF THE AMPLITUDE OF THE ANNUAL VARIATION. THIS IS NOT OBSERVED IN SOME AREAS, BUT IN THE ARCTIC BASIN THERE ARE FIVE REGIONS WHERE THE AMPLITUDE OF THE PRESSURE VARIATION EXCEEDS 0.5 MB. WITH A CHANGE IN LONGITUDE FROM WEST TO EAST THE PHASES OF THESE VARIATIONS DECREASE BY A VALUE APPROXIMATELY CORRESPONDING TO THE LONGITUDE DIFFERENCE OF THESE REGIONS. CHANGES DO NOT OCCUR GRADUALLY, BUT IN A JUMP. THE AUTHOR GIVES PARTICULAR ATTENTION TO THIS PHENOMENON AND ITS EFFECTS IN THREE OF THE REGIONS OF INCREASED NUTATIONAL PRESSURE ANOMALIES: THOSE OVER THE BARENTS SEA, TAYMYR PENINSULA IS ON HOW THIS AFFECTS THE ICE CONTENT OF THESE SEAS.

UNCLASSIFIED

3/3 021 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AT0110675

ABSTRACT/EXTRACT--FOR EXAMPLE, THE ICE CONTENT OF THE LAPTEV SEA IS DETERMINED BY THE PRESSURE GRADIENT BETWEEN THE FIRST AND THIRD OF THE ABOVE MENTIONED REGIONS. THE MOST UNFAVORABLE ICE CONDITIONS OCCUR WHEN THE RADIUS VECTOR PASSES THROUGH THE GREENWICH MERIDIAN; THE MOST FAVORABLE ICE CONDITIONS PREVAIL WHEN THE RADIUS VECTOR PASSES THROUGH THE MERIDIAN 180DEGREES. AS A COMPLICATING FACTOR, DURING DIFFERENT PERIODS THE AIR TRANSFER ANOMALIES EXERT A DIFFERENT EFFECT ON THE FORMATION OF ICE CONDITIONS. THE MOST IMPORTANT MONTH IS MAY, WHEN THE MAXIMUM NUTATIONAL ANOMALIES OF AIR TRANSFER ARE OBSERVED. DURING YEARS WHEN NUTATIONAL ANOMALIES OCCUR IN MAY THE POLE TIDE PRESSURE WAVE HAS ITS GREATEST EFFECT ON ICE CONDITIONS. THIS OCCURS EACH SEVEN YEARS.

FACILITY: ARCTIC AND ANTARCTIC SCIENTIFIC RESEARCH INSTITUTE.

UNCLASSIFIED

1/3 027 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--SOLAR ACTIVITY, EARTH'S PRESSURE FIELD AND ATMOSPHERIC CIRCULATION -U-

AUTHOR-(02)-SARUKHANYAN, E.I., SMIRNOV, N.P.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, GEOMAGNETIZM I AERONOMIYA, VOL X, NO 3, 1970 PP 496-500.

DATE PUBLISHED--------70

SUBJECT AREAS--ATMOSPHERIC SCIENCES

TOPIC TAGS--ATMOSPHERIC CIRCULATION, SOLAR ACTIVITY, PRESSURE, CLIMATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1724 STEP NO--UR/0203/70/010/003/0496/0500

CIRC ACCESSION NO--AP0135307

UNCLASSIFIED

2/3 027 UNCLASSIFIED

CIRC ACCESSION NO--AP0135307 PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WITH AN INTENSIFICATION IN SOLAR ACTIVITY DURING THE 11 YEAR CYCLE IN THE HIGH LATITUDES THE PRESSURE INCREASES, WHEREAS IN THE SUBTROPICAL REGIONS IT DECREASES. HOWEVER, IN ADDITION TO THE 11 YEAR CYCLE THERE ARE SECULAR CHANGES IN SOLAR ACTIVITY. IT IS NATURAL TO EXPECT THAT DURING THE SECULAR CYCLE THERE SHOULD BE OBSERVED THE SAME RESPONSE OF ATMOSPHERIC PRESSURE TO THE INCREASE IN SOLAR DISTURBANCES AS DURING THE 11 YEAR CYCLE. IN CONFIRMING THIS THE AUTHORS EXAMINED THE REGION OF THE NORTH ATLANTIC BEST COVERED WITH OBSERVATIONAL DATA ON ATMOSPHERIC PRESSURE. A STUDY WAS MADE OF THE CHANGE IN PRESSURE FROM THE BEGINNING OF THIS CENTURY WHEN THE MEAN LEVEL OF SOLAR ACTIVITY WAS LOW TO THE MIDDLE OF THE CENTURY WHEN MAXIMUM VALUES WERE ATTAINED. TWO REGIONS OF THE ALANTIC WERE EXAMINED: ONE TO THE NORTH OF 55DEGREESN, COVERING THE REGION OF THE ICELANDIC LOW, AND THE OTHER SITUATED TO THE SOUTH OF 55DEGREES, CHARACTERIZED BY HIGH ATMOSPHERIC PRESSURE. THE ANALYSIS LEADS TO A CONCLUSION WHICH CONTRADICTS THE FEDOROV VIZE "SCCENTUATION" LAW WHICH STATES THAT WITH AN INTENSIFICATION OF SOLAR ACTIVITY DURING THE 11 YEAR CYCLE THERE IS AN INTENSIFICATION AND ACCENTUATION OF THE PRESSURE FIELD OF A PARTICULAR SIGN, THAT IS, THERE IS A DEEPENING OF CYCLONES, WHEREAS PRESSURE INCREASES IN ANTICYCLONIC FORMATIONS. DUE TO THE INSEPARABLE UNITY OF CHANGES IN STRUCTURE OF THE EARTH'S PRESSURE FIELD AND GENERAL CIRCULATION, THE MANIFESTATION OF SOLAR ACTIVITY WILL BE REFLECTED IN THE NATURE OF CIRCULATORY PROCESSES.

UNCLASSIFIED

3/3 027 UNCLASSIFIED

CIRC ACCESSION NO--AP0135307 PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--WITH AN INTENSIFICATION OF SOLAR ACTIVITY DURING THE 11 YEAR AND SECULAR CYCLES THERE WILL BE AN IMPAIRMENT OF ZONAL TRANSFER AND DEVELOPMENT OF MERIDIONAL PROCESSES. WITH AN INTENSIFICATION OF SOLAR ACTIVITY IN THE HIGH LATITUDES AND THE ZONE OF STATIONARY PRESSURE FORMATIONS THERE IS AN INCREASE IN PRESSURE. IN THE SUBTROPICAL ZONE, WHERE STATIONARY ANTICYCLONES PREVAIL, PRESSURE DROPS AT THIS TIME. ACCORDINGLY, DURING THE MAXIMUM OF SOLAR ACTIVITY THERE IS ESSENTIALLY A DEACCENTUATION OF THE PRESSURE FIELD. THIS NATURE OF THE BEHAVOIR OF THE PRESSURE FIELD UNDER THE INFLUENCE OF SOLAR DISTURBANCE HAS AS A RESULT THE IMPAIRMENT OF ATMOSPHERIC CIRCULATION DURING EPOCHS OF A HIGH LEVEL OF SOLAR ACTIVITY AND AN INTENSIFICATION OF MERIDIONAL PROCESSES, WHICH IS RESPONSIBLE FOR A CORRESPONDING NATURE OF FLUCTUATIONS IN THE EARTH'S CLIMATE. FACILITY: INSTITUTE OF BIOLOGY OF INTERNAL WATERS.

UNCLASSIFIED

USSR

UDC 621.385.64

NEKRASOV, L. G., ROGOZHNIKOV, A. L., SMIRNOV, N. S.

"The Problem of the Properties of the Space Charge of a Magnetron"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronics Technology. Scientific-Technical Collection. Microwave Electronics), 1970, Issue No 10, pp 132-133 (from RZh--Elektronika i yeye primeneniye, No 2, February 1971, Abstract No 2A166)

Translation: The results which are presented of an experimental investigation of a power pulse magnetron confirm the accepted model of a space charge in the form of an oscillatory circuit. 2 ref. Author's Summary.

1/1

USSR

UDC 621.378.9:621.395.623

VAKULENKO, A. M., DIVIL'KOVSKIY, I. M., KOVALEVSKIY, D. V., SMIRNOV, N. V.

"The TO-2 Optical Telephone"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 4, "Sovetskoye Radio", 1971, pp 134-136

Abstract: The paper describes the TO-2 telephone system based on a gallium arsenide semiconductor laser of the injection type. The system has a line-of-sight range of about 5 km, which can be increased by separating the transmitting and receiving channels, thus eliminating the beam splitter used in the common-channel transceiver, which introduces a power loss of about 75 percent. The system is designed for simultaneous two-way communication. A working model of the TO-2 system was put on display in the "Physics" pavillion of the Exhibition of Achievements of the National Economy in 1970. The transmitting laser has a threshold current of 30-50 amps, and emits on a wavelength of the order of 0.9 micron. Power consumption is no more than 3.5 W at a supply voltage of 9 V. Two figures, bibliography of three titles.

1/1

USSR

SMIRNOV, O. K. UDC: 8.74

"An Automaton Model of Distribution of Limited Resources of an Organizational Structure in the Case of Random Flow of Demands"

Moscow, Detsentralizovan. metody upr.--sbornik (Decentralized Methods of Control--collection of works), 1972, pp 9-18 (from RZh-Matematika, No 1, Jan 73, abstract No 1V820)

Translation: The author considers a class of organizational structures with a given topological structure; these organizational structures are subjected to a random flow of objects (in the form of demands or resources) which belong to a given set of types $OP \in \{O_j\}$, where $j = 1, 2, \ldots, I$ is the tag for the type of object, and $p = 1, 2, \ldots$ is the tag for the object. An object of the j-th type may remain in the system for time τ_j, after which it drops out of the given system and is handled in a slow-acting system without restriction on serving time. It is assumed that the organization is made up of elements of two types: buffers (warehouses, hoppers, computer storage, etc.) B_i ($i = 1, 2, \ldots, I_B$) which involve only storage of objects; and actuating resolving elements (machine tools, employees, computers, etc.) R_i ($i = 1, 2, \ldots, I_R$) whereby the objects are served.

1/1

USSR

SMIRNOV, O. K.

"Automatic Model of Distribution of Limited Resources of Organizational Structure with Random Flow of Requests"

Detsentralizovan. Metody upr. [Decentralized Control Methods -- Collection of Works], Moscow, 1972, pp 9-18 (Translated from Referativnyy Zhurnal, Kibernetika, No 1, 1973, Abstract No 1 V820).

Translation: A class of organizational structures with fixed structural topology is studied, which receives a random flow of objects (in the form of requests or resources) belonging to a fixed set of types $O_j^p \in \{O_j\}$, where $j = 1, 2, \ldots, I$ is the object type mark, $p = 1, 2, \ldots,$ is the object mark. An object of j-th type can be located in the system for time τ^j, after which it drops out of the system and is serviced in a slower system without limitations on servicing time. It is assumed that the organization is formed of elements of two types: buffers (warehouses, hoppers, computer memory, etc.) B_i $(i = 1, 2, \ldots, I_B)$ where the objects are simply stored, and decision and actuating elements (machine tools, workers, computers, etc.) R_i $(i = 1, 2, \ldots, I_R)$ where the objects are serviced.

1/1

SMIRNOV, O.L.

JPRS 55938

9 May 1972

UDC 621.391.1

THE PROBLEM OF COMPRESSION OF LITERAL MESSAGES

(Article by O. L. Smirnov and E. L. Yunakov, Moscow, Problemy Peredachi Informatsii, Russian, Vol 8, No 1, 1972, signed to press 16 Nov 1970, pp 99-100).

The problem is stated of ordering of words in dictionary A=(a[i]) in alphabet q so as to allow minimization of the mean length of the code for literal coding of the x words and arbitrary coding of the remaining words. A method is suggested for solving the problem, reduced to running through all possible ordering versions.

Suppose messages from a certain set of words A=(a[i]) , i=1,2,...., N in alphabet q are being transmitted, and transmission is performed using 2 symbols "0" and "1." An example of such methods used is the text of telegrams utilizing the words of the Russian language. Proper transmission requires coding of all words in set A by a certain binary code V satisfying the following natural limitations:

Two different messages must be coded by different binary sequences.

If the messages are coded word by word by a certain code V:(a[i]→V[i]), in which each word a_i from set A corresponds to binary word V_i from set V, with known frequencies pi of appearance of each of the words, any code V(a) can be set in correspondence with the quantity

$$L(V) = \sum_{i=1}^{N} p_i |V_i|, \qquad (1)$$

called the mean code length.

$|x|$ here and subsequently represents the length of word x.

USSR

UDC: 621.73.043

OKHRIMENKO, Ya. M., SMIRNOV, O. M., BALAKIN, V. P., BOYTSEKHOVSKIY, V. A., SHKLYAYEV, V. Ye.

"Process of Production of Long-Axis Forgings by Extension in the Superplastic State"

Kuznechno-Shtampovochnoye Proizvodstvo, No 1, Jan 73, pp 7-10.

Abstract: A process of monaxial form change in the state of superplasticity, the relationship between initial and final dimensions of the piece, kinematic plans of experimental installations and the dependence between the primary parameters of the process in the initial and stable stages are studied. The conditions of development of the state of superplasticity are also studied. Examples of products produced by this method are presented and the advantages and disadvantages are noted.

Samarov, O.A.

TRPS 5787
Trans. in Metallurgy
15 Dec. 72

ON THE SUPERPLASTICITY OF VT2-1 TITANIUM ALLOY

[Article by Ya. M. Okhrimenko, O. A. Samarov, L. V. Surnach, M. M. Kuchkov, Moscow Institute of Steel and Alloys, Department of Pressure and Forging Industry; Sverdlovskiy, Izvestiya Vuzov, Tsvetnaya Metallurgiya, Russian, No 4, 1972, signed to press 20 September 1971, pp 153-156]

The optimum temperature-rate conditions of deformation of VT2-1 alloy in the superplastic state are established. Under the stated conditions VT2-1 alloy exhibits distinct properties of superplasticity.

Heat and corrosion, possessing high specific tenacity, resistance to modern aerospace engineering and many other important branches of industry. Hot deformation of titanium alloys involves a number of difficulties, attributed to their comparatively low thermal conductivity, tendency to bind with tool materials and to form an alpha-film. The reduction of deformation temperature under ordinary conditions leads to a sharp increase in resistance to deformation and to a loss of tool strength. Therefore it is extremely important to consider the technological capabilities that have been discovered recently in connection with superplasticity of metals and alloys.

Investigation of the state of superplasticity of the temperature-rate parameters of deformation in the superplasticity mode of the two-phase titanium alloy VT2-1 of the following composition (in %): 6.2 Al, 2.6 Mo, 1.9 Cr, 0.44 Fe, 0.26 Si, 0.12 C, 0.05 N, 0.015 H.

The investigation was conducted on the metal of a single melt, hot rolled and annealed at 870° for 1 hour. Cylindrical rupture specimens with a working length of 25 ± 0.1 mm and diameter of 5 ± 0.01 mm, were prepared from rods 35 mm in diameter of this metal.

The temperature ranges of phase conversion for the investigated material, established on the basis of the curves of change of electrical resistance, thermal effect of conversion and temperature [1] during

USSR

UDC 621.315.592

OKSMAN, YA.A., SEMENOV, A.A., SMIRNOV, V.N., SMIRNOV, O.M.

"On The Multiphoton Absorption In Wide-Band Semiconductors"

Fizika i tekhnika poluprovodnikov, Vol 6, No 4, Apr 1972, pp 731-733

Abstract: Specimens of GaAs, ZnSe, and ZnS were irradiated by intense luminous fluxes in the region of transparency. For excitation, ruby and neodymium lasers were used which furnished single pulses with an energy less than one Joule and a duration of 50 and 100 nanosec, respectively. The dependence is found: 1) Of nonequilibrium absorption and the concentration of carriers (GaAs only) on the intensity of laser emission; 2) Of the photodielectric signal (nonequilibrium complex conductivity) on the intensity of laser emission; and 3) Of the photodielectric signal (effectiveness of photoresponse) in single crystal ZnS on the energy of the photons of the illuminator $\hbar\omega$ at constant intensity of the laser emission. The results provide a reason for considering that in wide-band semiconductors with a wide spectrum of impurity states which are exposed to the effect of powerful light pulses with $\hbar\omega_0 < E_g$, impurity one- and two-photon generation of carriers appears in the first place; in the latter case it evidently goes through real compound states. 3 fig. 6 ref. Received by editors, 27 Jan 1971; in final rewording, 13 July 1971.

1/1

USSR

UDC 621.7.011

OKHRIMENKO, Ya. M., SMIRNOV, O. M., SURMACH, L. V., KUCHINOV, M. M.

"Superplasticity of VTZ-1 Titanium Alloy"

Ordzhonikidze, Isvestiya Vysshikh Uchebnykh Savedeniy, Tsvetnaya Metallurgiya, No 4, 1972, pp 133-136.

Abstract: The optimal temperature and rate conditions for deformation of VTZ-1 alloy to the state of superplasticity are established: temperature interval 800-950°, rate interval 10^{-3}-10^{-4} sec^{-1}; it is shown that the single-phase β area should not be entered during heating. Under these temperature and rate conditions, clear signs of the state of superplasticity were produced in VTZ-1 alloy, i.e., exceptionally high values of relative elongation (δ = 950%) in combination with low deformation resistance (σ = 0.4-4 kg/mm^2) and a coefficient rating sensitivity of deformation resistance to deformation rate m > 0.4. These data indicate good prospects for the use of the effect of superplasticity in the pressure working of metals.

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USSR

UDC 632.95

OGNEVA, N. YE., SMIRNOV, O. P., Moscow Institute of Chemical Technology imeni D. I. Mendeleyev, Moscow, Ministry of Higher and Secondary Specialized Education RSFSR

"Method of Preparing 2,4,6-Trimethyleneacrylamide-Sym-1,3,5-Triazine"

USSR Author's Certificate No 250912, filed 8 Jul 68, published 16 Feb 70 (from RZh-Khimiya, No 18, 25 Sep 70, Abstract No 18N711 P, by N. B. Vsevolozhskaya)

Translation: The compound in the article title (I) was prepared by the reaction of methylolacrylamide (II) with melamine at 90-96°. For example, 1 mole melamine and 215 ml water are heated on a boiling-water bath for 10 min, the temperature is reduced to 90-91°, and 3.1 mole II is added to the mixture with agitation, the temperature is raised to 95-96°, and condensation is carried out for 10-15 min; the solution is cooled rapidly to 20°, and then down to 2-5°. The settling precipitate is filtered off and reprecipitated from water with cooling. I is obtained, yield 80%, and m. p. 153.

1/1

USSR

UDC: 669.71.018.95:621.785.3

SMIRNOV, P. B., YELYUTIN, V. P., MOZZHUKHIN, Ye. I., Moscow

"Electrothermal Treatment of SAP Materials"

Izvestiya Akademii Nauk SSSR, Metally, No 4, Jul-Aug 73, pp 205-208.

Abstract: In this work, an attempt was made to introduce oxygen to the aluminum matrix of SAP by electrothermal treatment with direct current. The treatment of the SAP caused the introduction of point defects to the aluminum matrix, which increased the stability of the dislocation structure. The point defects have significant thermal stability.

1/1

Circuit Theory

USSR

UDC 621.3.019.3

SMIRNOV, R. A.

"On the Problem of Deviation of the Parameters of an Electronic Circuit When There are Considerable Changes in the Parameters of its Elements"

Tr. Altaysk. politekhn. in-ta (Works of the Altai Polytechnical Institute), 1970, vyp. 12, pp 30-38 (from RZh-Radiotekhnika, No 7, Jul 71, Abstract No 7A71)

Translation: A computational procedure is outlined which is based on introducing generalized coefficients -- sensitivities of first and second orders which relate relative changes in the parameters of elements to the relative changes or absolute changes in circuit parameters. The change in the drop of the pulse peak in a two-stage pulse amplifier as a result of tube aging is considered as an example. It is assumed that the amplifier is covered by complex feedback by means of a circuit connected between the plate of the second and the cathode of the first stage. An increase in the depth of feedback reduces the depth of the drop, but at the same time increases the instability of the drop, which must be taken into account in designing correction circuits. Bibliography of two titles. N. S.

1/1

USSR

UDC: 621.374.4

KUZ'MIN, Yu. G., SMIRNOV, R. A.

"Low-Frequency Correction of a Transistor Stage With Parallel Control"

Tr. Altaysk politekhn. in-ta (Works of the Altai Polytechnical Institute), 1970, vyp. 12, pp 130-136 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D37)

Translation: The authors consider a stage with parallel control in the long (switching) time region. A formula is derived for the so-called operational gain of the stage. The drop-off of the pulse peak at the output of the stage is determined. The order of calculation of the amplifier with correction is shown. Bibliography of four titles. N. S.

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USSR

UDC: 621.375.029

SMIRNOV, R. A.

"Some Possibilities of Reducing the Coefficients of Harmonics in Audio Frequency Amplifiers"

Tr. Altaysk. politekhn. in-ta (Works of the Altai Polytechnical Institute), 1970, vyp. 12, pp 21-29 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D104)

Translation: The author considers the possibility of improving the linearity of audio frequency amplifiers by using nonlinear elements. It is shown that the coefficients of harmonics can be reduced several times over by using nonlinear negative feedback implemented in the form of a circuit with a semiconductor diode. The use of positive feedback also reduces the coefficients of harmonics, in this case without reducing gain. Bibliography of five titles. N.S.

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USSR

UDC 616-001.29

SHIRKOV, R. V., and KURKOVSKIY, V. P., Leningrad Scientific Research Institute of Neurosurgery imeni A. L. Polenov

"Relative Biological Effectiveness of Electrons With An Energy of 20 Mev Assessed from Necrosis of Rabbit Brain Tissues"

Moscow, Doklady Akademii Nauk SSSR, No 4, 1971, pp 954-955

Abstract: The brains of rabbits were irradiated once with x-rays (3,500, 400 and 500 rads), once with electrons with an energy of 20 Mev (3,300, 4,000, 5,000, 6,250 and 8,200 rads), or fractionally with electrons with an energy of 20 Mev (5,200, 6,400, 6,800, 8,000, 10,400, 14,900, and 15,200 rads) 400 rads per session three times a week. Histological examination of brain sections from the animals sacrificed 5 to 8 months after irradiation revealed signs of degeneration of the nerve cells and necrotic foci; the intensity of the changes were most pronounced in the animals irradiated once and were in proportion to the dose received. The smallest does of electron radiation that caused necrosis was 10,400 rads after 60 days' when applied fractionally and 6,250 rads when applied once. The smallest dose of x-radiation to cause necrosis was 4,000 rads. The relative biological effectivenss of electrons with an energy of 20 Mev is therefore 0.64 (4,000 ÷ 6,250.).

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USSR

UDC 611.81-091-073.753.1]57.085:599.325

KURKOVSKIY, V. P., and SMIRNOV, R. V., Laboratory of Neurohistology and Department of Radiology, Leningrad Scientific Research Institute of Neurosurgery imeni Professor A. L. Polenov

"Morphological Changes in Rabbit Brain After Fractional Irradiation of the Head by Fast Electrons"

Leningrad, Arkhiv Anatomii, Gistologii, i Embriologii, Vol 62, Vyp 3, 1972, pp 58-65

Abstract: Seven rabbits were irradiated with doses of 400 rad/treatment every other day for 25-74 days with a 100 rad/min electron beam (20 Mev) directed at the right eye socket, through the brain to the left ear, in order to study brain morphological changes that may occur through electron therapy on humans. Brain tissue from sacrificed animals was fixed, stained, sectioned, and observed under a light microscope. Two rabbits were sacrificed 1 month after termination of treatment (total doses 6,000 and 12,800 rad) due to acute external manifestations. Inflammation and infiltration of brain matter and meninges by polyblasts and plasma cells was detected. Externally the remaining rabbits manifested only minor, localized depilation and skin pigmentation. A rabbit receiving 6,400 rad total dose suffered only gliosis of the right optic

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USSR

KURKOVSKIY, V. P., and SMIRNOV, R. V., Arkhiv Anatomii, Gistologii, i Embriologii, Vol 62, Vyp 3, 1972, pp 58-65

nerve 6 months 24 days after treatment termination. There were no significant changes in rabbits receiving 5,200 and 6,800 rad total doses, inspected 5 months after treatment termination. Five months after treatment termination the last two rabbits (14,900 and 15,200 rad total doses) had hemorrhaging, degeneration and necrotic foci in parenchyma and stroma (predominantly in the white matter), and intensive neuroglial development. Astrocytes fused into perifocal neuroglia were linked with a probable degenerate tissue removing function.

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USSR

GONCHUKOV, V. V., LEYZER, V. P., SMIRNOV, R. V., TYURIN, A. Ya.

"Development and Study of Small Memory Cubes Based on Thermally Stable Ferrite Cores"

Moscow, Magnitnyye Elementy Pamyati, 1972, pp 67-71.

Abstract: This article studies problems related to the development and investigation of small memory cubes of magnetic cores. As an example, a 1024 16-bit word memory unit designed for matrix-type storage systems is studied. The analysis of designs of small memory sections shows that arrangement of a memory section on a flat plane has definite advantages over other arrangements. A photograph of the memory unit studied is presented.

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USSR

UDC 621.226

SMIRNOV, S. A., RAN, E. N., and PAN'KOV, M. S., Institute of Geology and Geophysics of the Siberian Department of the Academy of Sciences USSR

"Control Valve of the Piston Motion of a Hydraulic Press up to 2 kbar"

Moscow, Pribory i Tekhnika Eksperimenta, No 1, Jan-Feb 72, pp 183—184

Abstract: A power switchboard of valve-type and its operation are described by reference to the flow sheet and the layout. The device, which was tested up to 1700 bar pressure, consists of four valves enclosed in a common body and a cam-type mechanism which makes it possible to open the valves in pairs. The device differs from known constructions of similar type by the presence of an abutment screw allowing smoothly to graze the high pressure before the change-over of the valves. The abutment screw is located on the slewing axis so that at the two available valve positions it can push in turn only the grazing valves. A multipositional control valve can be developed analogously. Two illustr., two biblio. refs.

1/1

USSR

AKSENOV, I. I., BELOUS, V. A., SMIRNOV, S. A.

UDC 621.387.332

"Some Singularities of the Operation of a Pulse Discharge Device With Hollow Starting Electrode"

Moscow, Radiotekhnika i Elektronika, Vol 16, No 7, Jul 71, pp 1254-1258

Abstract: The paper presents the results of an experimental study of a new controllable low-pressure gas-discharge pulse device with pure metal cold cathode for switching high-power current pulses. The starting electrode is located in the cavity of the cathode and takes the shape of a hollow cylinder broken up into "honeycomb" cells by dividers. The data presented show the feasibility of using a discharge with hollow cathode to control a low-pressure cold-cathode gas-discharge device. The use of a "honeycomb" igniting electrode noticeably improves the starting characteristics of the device. The time characteristics of the commutator in the "standby" (preparatory) discharge mode in the trigger chamber approach the corresponding characteristics of hot-cathode devices. The results of the studies can be used in developing commutators for use in high-power pulse installations: both under conditions inherent in pulse thyratrons, and under conditions of switching isolated high-power pulses which are typical of some fields of experimental physics and new areas of industrial technology.

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USSR

UDC 621.385:537.525

AKSENOV, I. I., AMELIN, V. Z., BARANOV, N. G., SLATIN, V. I., SMIRNOV, S. A.

"Construction, Electrical, and Operating Characteristics of Heavy-Current Controlled Discharger"

Elektron. tekhnika. Nauchno-tekhn. sb. Gazorazryadn. pribory (Electronic Technology. Scientific-Technical Collection. Gas-Discharge Devices), 1970, Issue 4(20), pp 67-71 (from RZh--Elektronika i yeye primeneniye, No 5, May 1971, Abstract No 5A170)

Translation: A discharger is described which is intended for operation in circuits of capacitance storage elements and protective devices, with voltages from several hundred volts to 10 kv. The device can commutate currents in a pulse up to 100 ka and is characterized at the same time by a resource well in excess of 3.10^4 of the discharge. The construction of the discharger and the technology of its production are described and the electrical and operational characteristics presented.

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USSR

UDC:621.791.052:539.4:669.15-194.55

SMIRNOV, S. A., Engineer, NIKITENKO, V. A., Engineer, and IVANOV, N. S., Engineer

"Increasing the Properties of Martensite-Class Steel Welded Joints by Dynamic Deformation"

Moscow, Svarochnoye Proizvodstvo, No. 10, Oct 70, pp. 31-32

Abstract: Investigations were made of welded joints of high-strength martensite steel produced by electric slag welding with a plate electrode and subjected to 25-50% plastic deformation after welding. The use of dynamic deformation of welded joints of martensitic steel produced by electric slag welding using a plate electrode allows a significant improvement in seam structure and in the zone around the seam and an increase in plastic properties of the welded joint.

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USSR

UDC: 621.316.933.1

AKSENOV, I. I., SMIRNOV, S. A.

"A Controllable Gas-Discharge Device"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329615, Division H, filed 18 Mar 70, published 9 Feb 72, pp 212-213

Translation: This Author's Certificate introduces a controllable gas--discharge device which contains an anode, a hollow cathode, and an ignition electrode located inside the anode. Holes are made in the wall of the cathode which faces the anode. As a distinguishing feature of the patent, the electrical strength is increased and the triggering and time characteristics are improved by making the ignition electrode in the form of two current-conducting plate pedestals arranged and connected in parallel, one located at the base of the hollow cathode facing the anode, and the other at the opposite wall of the cathode.

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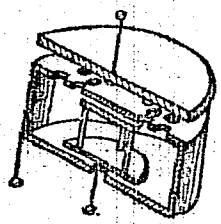
USSR

AKSENOV, I. I., SMIRNOV, S. A., USSR Author's Certificate No 329615



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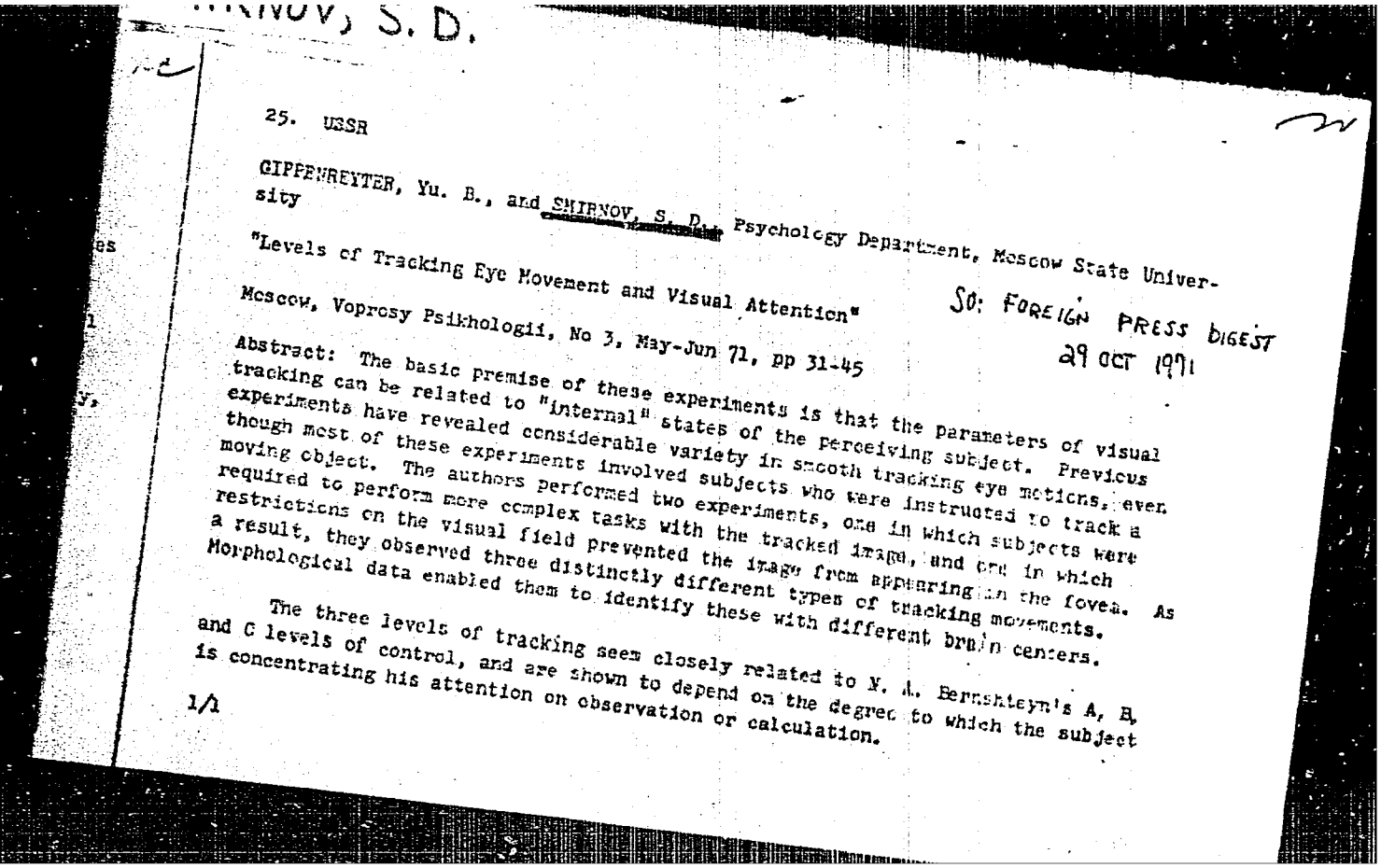

...NOV, S. D.

25. USSR

GIPPENREYTER, Yu. B., and SMIRNOV, S. D., Psychology Department, Moscow State University

"Levels of Tracking Eye Movement and Visual Attention"

Moscow, Voprosy Psikhologii, No 3, May-Jun 71, pp 31-45

SO: FOREIGN PRESS DIGEST 29 OCT 1971

Abstract: The basic premise of these experiments is that the parameters of visual tracking can be related to "internal" states of the perceiving subject. Previous experiments have revealed considerable variety in smooth tracking eye motions, even though most of these experiments involved subjects who were instructed to track a moving object. The authors performed two experiments, one in which subjects were required to perform more complex tasks with the tracked image, and one in which restrictions on the visual field prevented the image from appearing on the fovea. As a result, they observed three distinctly different types of tracking movements. Morphological data enabled them to identify these with different brain centers.

The three levels of tracking seem closely related to N. A. Bernshteyn's A, B, and C levels of control, and are shown to depend on the degree to which the subject is concentrating his attention on observation or calculation.

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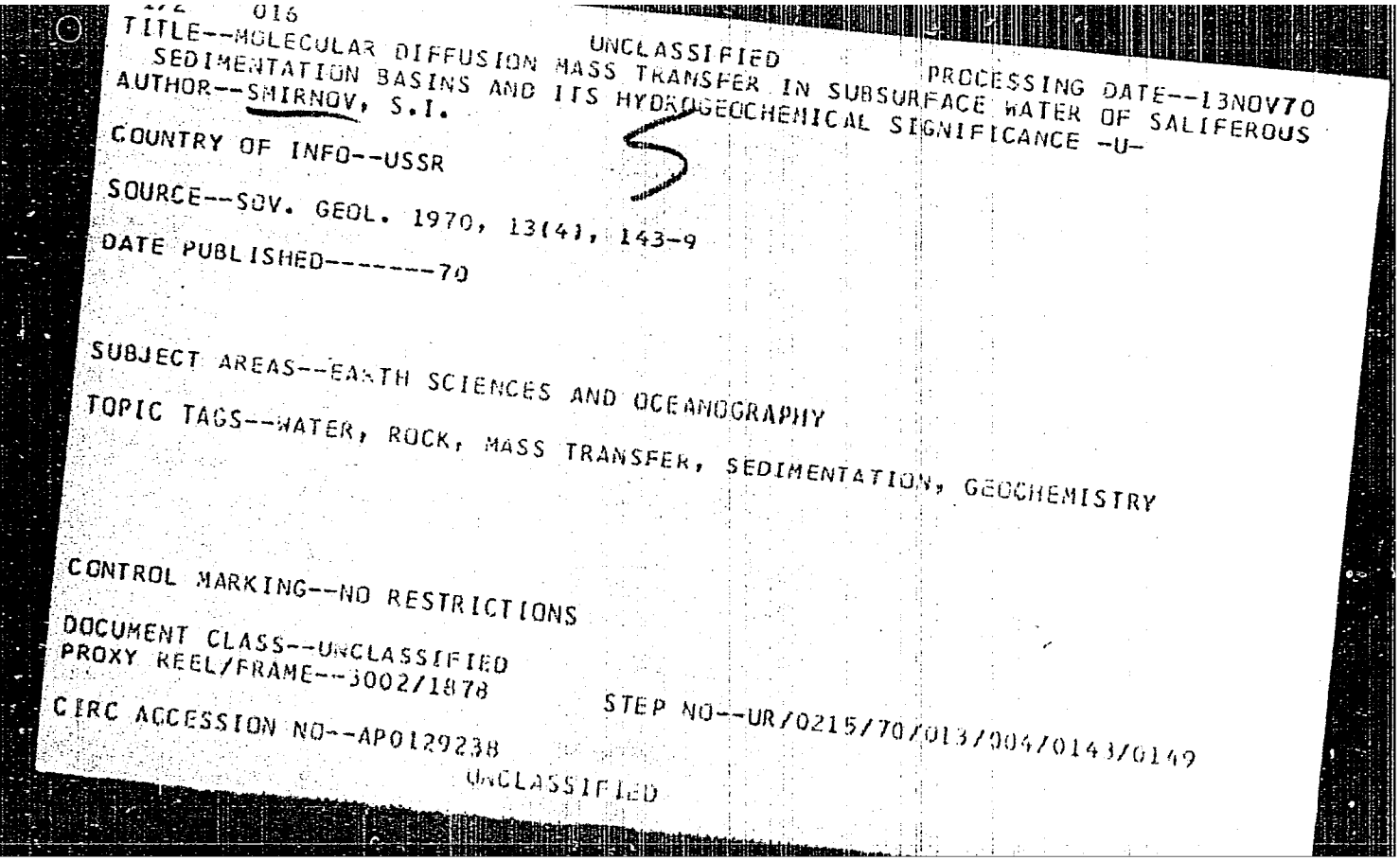


016 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--MOLECULAR DIFFUSION MASS TRANSFER IN SUBSURFACE WATER OF SALIFEROUS SEDIMENTATION BASINS AND ITS HYDROGEOCHEMICAL SIGNIFICANCE -U-

AUTHOR--SMIRNOV, S.I.

COUNTRY OF INFO--USSR

SOURCE--SOV. GEOL. 1970, 13(4), 143-9

DATE PUBLISHED-------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--WATER, ROCK, MASS TRANSFER, SEDIMENTATION, GEOCHEMISTRY

CONTROL MARKING--NO RESTRICTIONS

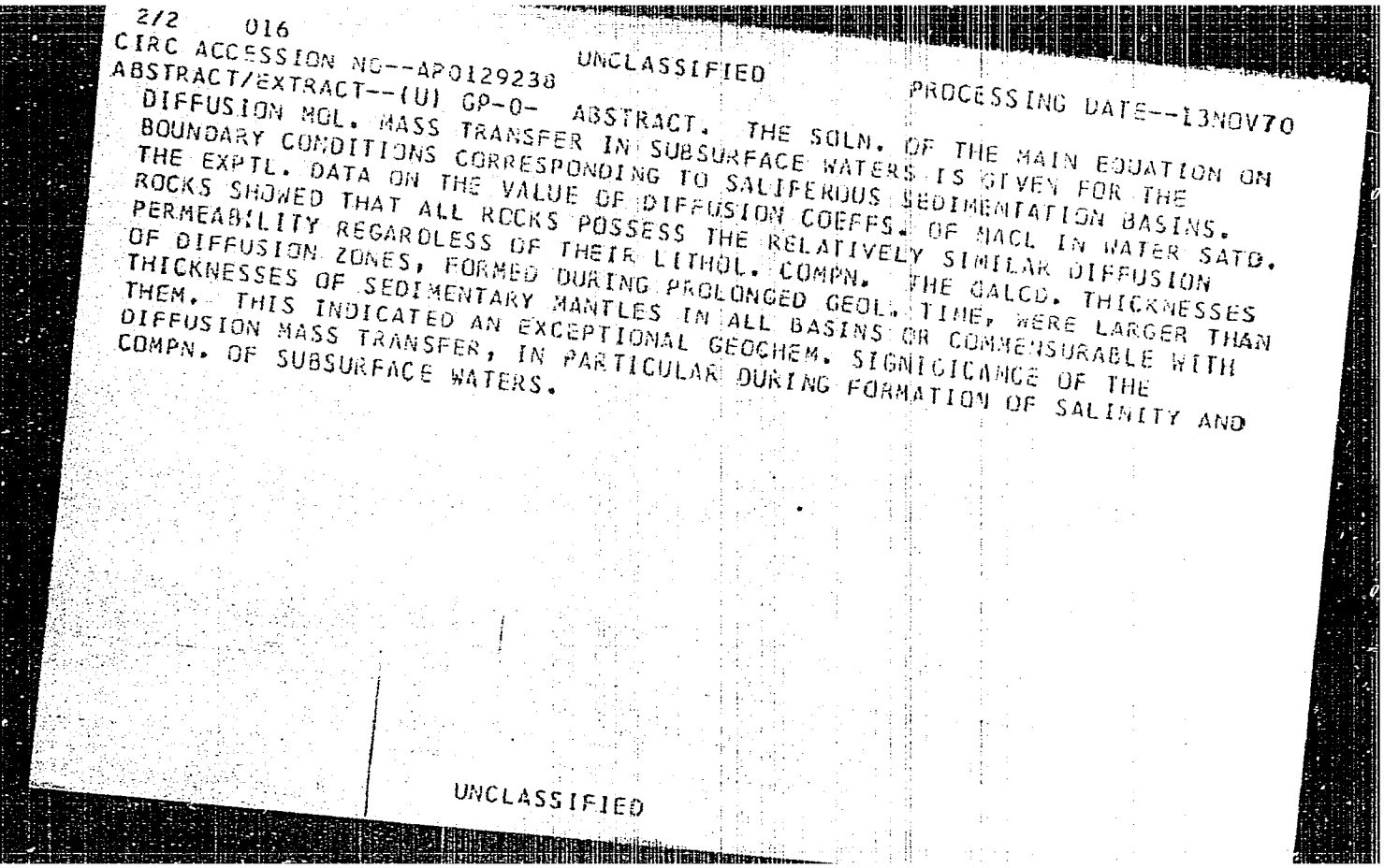
DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1878

STEP NO--UR/0215/70/013/004/0143/0149

CIRC ACCESSION NO--AP0129238

UNCLASSIFIED



2/2 016 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0129238
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SOLN. OF THE MAIN EQUATION ON DIFFUSION MGL. MASS TRANSFER IN SUBSURFACE WATERS IS GIVEN FOR THE BOUNDARY CONDITIONS CORRESPONDING TO SALIFEROUS SEDIMENTATION BASINS. THE EXPTL. DATA ON THE VALUE OF DIFFUSION COEFFS. OF NACL IN WATER SATD. ROCKS SHOWED THAT ALL ROCKS POSSESS THE RELATIVELY SIMILAR DIFFUSION PERMEABILITY REGARDLESS OF THEIR LITHOL. COMPN. THE CALCD. THICKNESSES OF DIFFUSION ZONES, FORMED DURING PROLONGED GEOL. TIME, WERE LARGER THAN THICKNESSES OF SEDIMENTARY MANTLES IN ALL BASINS OR COMMENSURABLE WITH THEM. THIS INDICATED AN EXCEPTIONAL GEOCHEM. SIGNIFICANCE OF THE DIFFUSION MASS TRANSFER, IN PARTICULAR DURING FORMATION OF SALINITY AND COMPN. OF SUBSURFACE WATERS.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203110005-7"

1/2 007 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--COMPLEXES OF MALONONITRILE WITH CUPROUS CHLORIDE -U-

AUTHOR-(04)-SMIRNOV, S.K., STRUKOV, O.G., DUBOV, S.S., DANILINA, L.L.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(5), 1305-7

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--COPPER COMPLEX, NITROGEN ISOTOPE, ORGANIC NITRILE COMPOUND

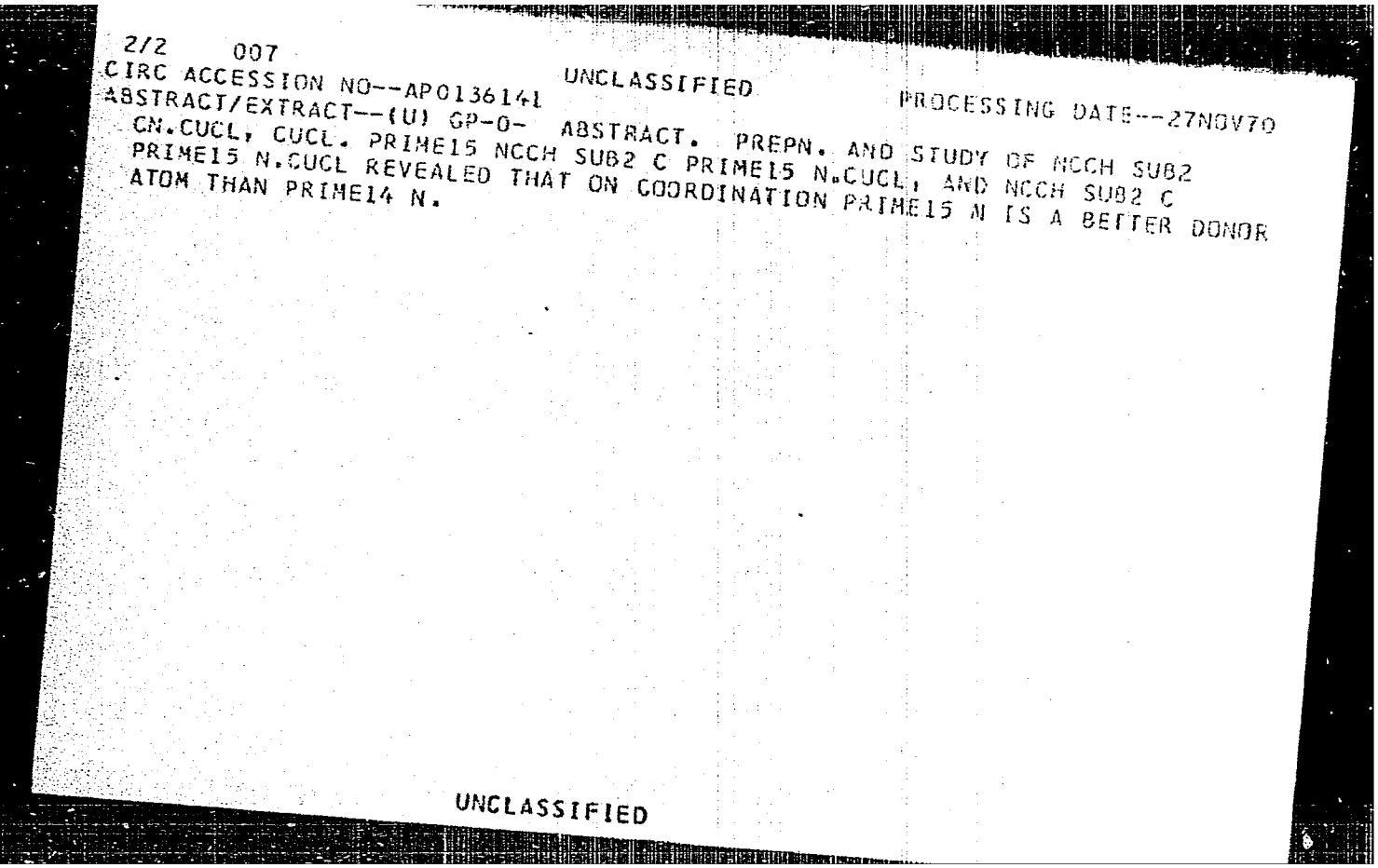
CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0702 STEP NO--UR/0078/70/015/005/1305/1307

CIRC ACCESSION NO--AP0136141

UNCLASSIFIED



2/2 007 UNCLASSIFIED
CIRC ACCESSION NO--AP0136141 PROCESSING DATE--27NOV70
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PREPN. AND STUDY OF NCCH SUB2 CN.CUCL, CUCL. PRIME15 NCCH SUB2 C PRIME15 N.CUCL, AND NCCH SUB2 C PRIME15 N.CUCL REVEALED THAT ON COORDINATION PRIME15 N IS A BETTER DONOR ATOM THAN PRIME14 N.

UNCLASSIFIED

USSR

UDC 621.314.263.072.6 (088.8)

GALOCHKIN, N.A., BASHENOV, I.A., SMIRNOV, S.L., MUDROV, L.P. [Ivanov. energ.in-t --Ivanov Power Institute]

"Device For Control Of Ferromagnetic Frequency Multiplier"

USSR Author's Certificate No 272424, filed 19 July 68, published 11 Sept 70 (from RZh--Elektronika i yeye primeneniye, No 4, April 1971, Abstract No 4B657P)

Translation: A device is proposed for control of a ferromagnetic frequency multiplier which is equipped with a choke coil with a magnetization winding connected in parallel to the input; the device contains a magnetic amplifier with operating and control windings located in its magnetic circuit, and diodes and a voltage data unit [datchik] at the output of the multiplier. In order to simplify the multiplier and to improve its characteristics, it is supplied with a data unit for the load current, the output of which is connected to the control winding of the magnetic amplifier situated at the center bar [sterzhen'] of the magnetic circuit. The latter is fulfilled by 3 bars; the operating windings are located at the outside bars, connected into the arms of an auxiliary rectifier which is fed from the winding of the voltage data unit and connected from the output side with the magnetization winding of the choke coil.

1/1

USSR

UDC 621.791.011:669.293

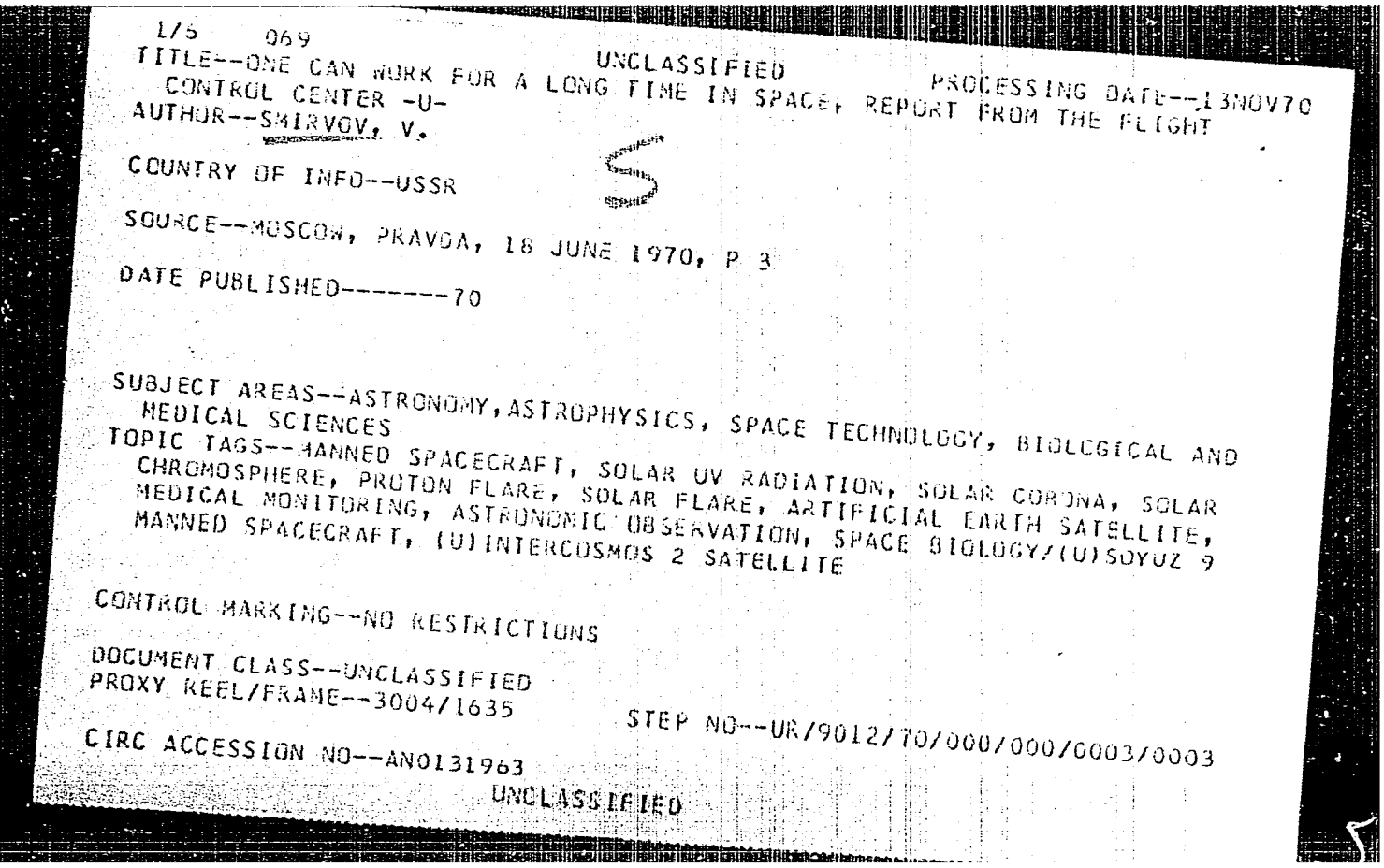
GUREVICH, S. M., NERODENKO, M. M., ASNIS, YE. A., and SMIRNOV, S. V.

"Durability of Niobium Welds under Varying Loads"

Kiev, Avtomaticheskaya Svarka, No 6, 1970, pp 72-73

Abstract: This short article presents the results of tests on the fatigue of niobium and its alloys performed by the Electric Welding Institute imeni Ye. O. Paton. Such tests are important because niobium is a prominent factor in the alloying of refractory metals. The tests were performed to compare welded compounds and the basic metal, and used niobium films 2 mm thick which had not undergone thermal processing, as well as annealed niobium tubes 28 mm in diameter with a wall thickness of 1 mm. The welding was done in a chamber with a controlled atmosphere of type-A argon. A table showing the mechanical characteristics of the metal and the welding is given. The tubes were tested for fatigue in bending in a special adaptation of the Afanas'yev method, all tests being conducted on the basis of $2 \cdot 10^6$ cycles. A photograph showing a niobium film which has undergone the tests is reproduced.

1/1



L/5 069 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--ONE CAN WORK FOR A LONG TIME IN SPACE, REPORT FROM THE FLIGHT CONTROL CENTER -U-
AUTHOR--SMIRNOV, V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PRAVDA, 18 JUNE 1970, P 3

DATE PUBLISHED-------70

SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS, SPACE TECHNOLOGY, BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--MANNED SPACECRAFT, SOLAR UV RADIATION, SOLAR CORONA, SOLAR CHROMOSPHERE, PROTON FLARE, SOLAR FLARE, ARTIFICIAL EARTH SATELLITE, MEDICAL MONITORING, ASTRONOMIC OBSERVATION, SPACE BIOLOGY/(U)SOYUZ 9 MANNED SPACECRAFT, (U)INTERCOSMOS 2 SATELLITE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3004/1635 STEP NO--UR/9012/70/000/000/0003/0003
CIRC ACCESSION NO--AN0131963
UNCLASSIFIED

2/6 069 UNCLASSIFIED

CIRC ACCESSION NO--AN0131963 PROCESSING DATE--13NOV7(

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FLIGHT OF A. G. NIKOLAYEV AND V. I. SEVAST'YANOV ON THE "SOYUZ 9" SHIP HAS CONTINUED FOR MORE THAN TWC WEEKS. MEDICAL SPECIALISTS PLAY THE PRINCIPAL ROLE IN STUDYING THE EFFECT OF A PROLONGED SPACE FLIGHT ON THE BODY. A DISCUSSION OF THIS SUBJECT WITH ONE OF THE DIRECTORS OF THE BIOMEDICAL SERVICE AT THE CENTER IS PUBLISHED BELOW. INTERESTING RESULTS HAVE ALSO BEEN OBTAINEC BY THOSE RESEARCHERS WHO ARE WORKING IN THE UV SPECTRAL REGION, STUDYINC PRIMARILY THE SUN. SOLAR UV RADIATION IS GENERATED IN THE OUTER REGIONS OF THE SUN, IN THE CHROMOSPHERE AND CORONA. INTERPRETATION OF THE INFORMATION WHICH THESE RAYS CARRY WILL HELP IN UNDERSTANDING THE STRUCTURE OF THE SOLAR CHROMOSPHERE AND CORONA AND PROCESSES OF INTERACTION AMONG POWERS OF MAGNETIC FIELDS, AS WELL AS HELPING IN THE STUDY OF PROTON FLARES AND OTHER MANIFESTATIONS OF SOLAR ACTIVITY. FOR EXAMPLE, INSTRUMENTATION FOR THE REGISTRY OF UV AND X RADIATION FROM THE SUN WAS CAUSED ON THE "INTERKOSMOS 2" SATELLITE. IT IS NOT IMPOSSIBLE THAT STUDY OF SOLAR X AND UV RADIATION WILL ENABLE US TO FORESEE IN TIME THE APPEARANCE OF PROTON FLARES. SUCH PREDICTIONS OF "COSMIC WEATHER" ARE EXTREMELY NECESSARY FOR ENSURING SAFETY ON DISTANT FLIGHTS OF COSMONAUTS. HOW CAN A MANNED ORBITAL STATION BE USED FOR ASTRONOMICAL PURPOSES? FIRST, IT WILL CARRY A TELESCOPE. EVEN A RELATIVELY SMALL INSTRUMENT WITH A LENS DIAMETER OF ABOUT A METER, PUT INTO ORBIT, WILL MAKE IT POSSIBLE TO SEE OBJECTS ON THE MOON HAVING A DIAMETER OF ABOUT 100 METERS AND ON THE MARTIAN SURFACE RELIEF DETAILS 15 KM OR MORE IN EXTENT.

UNCLASSIFIED

3/6 069 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0131963

ABSTRACT/EXTRACT--AS A COMPARISON, WE RECALL THAT THE MOST POWERFUL OF TERRESTRIAL TELESCOPES IS NOT CAPABLE OF DISTINGUISHING FEATURES ON THE MOON LESS THAN A KILOMETER IN DIAMETER. FROM ABOARD AN ORBITAL STATION EQUIPPED WITH THE TELESCOPE WHICH I MENTIONED IT WOULD BE POSSIBLE TO DETECT A PLANET AMONG THE OTHER STARS, EVEN AT A DISTANCE OF TENS OF LIGHT YEARS AWAY. THIS IS AN ABSOLUTELY INSURMOUNTABLE PROBLEM FOR GROUND OBSERVATORIES. SINCE DURING THE OBSERVATIONS THE TELESCOPE MUST BE STABILIZED WITH A GREAT ACCURACY, THE INSTRUMENT WILL PROBABLY HAVE TO BE PUT OUTSIDE THE SPACESHIP. THE FACT IS THAT UNDER WEIGHTLESSNESS CONDITIONS EVEN THE MOST INSIGNIFICANT MOVEMENTS OF A COSMONAUT CAN CAUSE THE SHIP TO ROCK. THEREFORE, IT IS EXCEEDINGLY DIFFICULT TO HOLD A MANNED SHIP IN A STIPULATED POSITION WITHE THE ACCURACY WHICH IS NECESSARY FOR ASTRONOMICAL OBSERVATIONS. HOWEVER, I BY NO MEANS WISH TO SAY THAT A MAN IS UNNEEDED ABORAD AN ASTRONOMICAL ORBITAL STATION. ON THE CONTRARY. AN AUTOMATED TELESCOPE ABOARD A SATELLITE IS A COMPLEX AND VERY EXPENSIVE INSTRUMENT. NATURALLY, IT REQUIRES SKILLED INSPECTION. THE PRESENCE OF A COSMONAUT ASTRONOMER WILL MAKE POSSIBLE THE MOST EFFECTIVE USE OF THE INSTRUMENTS PUT INTO CIRCUMTERRESTRIAL ORBIT FOR THE ADVANCE OF SCIENCE AND LEARNING ABOUT THE SURROUNDING UNIVERSE. UNDOUBTEDLY THE DEVELOPMENT OF COSMONAUTICS WILL MAKE IT POSSIBLE FOR ASTRONOMERS TO PENETRATE MUCH DEEPER INTO THE ESSENCE OF THE LAWS WHICH CONTROL THE UNIVERSE. IN THE LONG RUN THIS WILL INEVITABLY BE REFLECTED IN THE RATES OF DEVELOPMENT OF THOSE BRANCHES OF SCIENCE AND TECHNOLOGY WHICH HAVE DIRECT PRACTICAL APPLICATION. O.

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4/6 069

CIRC ACCESSION NO--AN0131963

ABSTRACT/EXTRACT--WHAT CAN BE SAID OF THE CONDITION OF THE SOYUZ 9 CREW? A. THE MEDICAL SERVICE IS ENTIRELY SATISFIED WITH THE CONDITION OF THE COSMONAUTS AND THEIR PERFORMANCE. AL THE PHYSIOLOGICAL INDICES WHICH WE ARE MONITORING HAVE STABILIZED WELL: FREQUENCY OF CARDIAC CONTRACTIONS, RESPIRATION, ARTERIAL PRESSURE AND ECG. IT WE EXAMINE THE DIAGRAMS OF THESE FUNCTIONS WE SEE AN ALMOST STRAIGHT LINE. Q. HOW IS THE MEDICAL MONITORING CARRIED OUT? A. WE USE DIFFERENT METHODS, INCLUDING REPORTS OF THE COSMONAUTS THEMSELVES, ANALYSIS OF THIER IMPLEMENTATION OF EXPERIMENTS, ETC. AN IMPORTANT ROLE IS PLAYED BY REGISTRY OF PHYSIOLOGICAL PARAMETERS BY MEANS OF TELEMETRY. FOR THIS PURPOSE THE COSMONAUTS PUT ON BELTS INTO WHICH MEDICAL PICKUPS ARE INSERTED. HOWEVER, THE MONITORING METHODS DO NOT REMAIN CONSTANT. THEY VARY IN DEPENDENCE ON THE FLIGHT MISSION, ITS DURATION. THEIR MAIN PURPOSE IS TIMELY DIAGNOSIS, DETERMINATION OF POSSIBLE UNFAVORABLE CHANGES IN THE PHYSIOLOGICAL FUNCTIONS OF THE HUMAN BODY. AT THE SAME TIME, THE MEDICAL MONITORING SYSTEM MUST BE ABLE TO PREVENT THESE DEVIATIONS FROM NORMALCY. THE "SOYUZ 9" CARRIES A PHARMACY WITH A SET OF MEDICINES, SYRINGES FOR INJECTIONS, AND OTHER MEDICAL INSTRUMENTS. HOWEVER, THE HEALTH OF OUR "PATIENTS" DURING THE FLIGHT HAS BEEN GOOD AND THERE HAS BEEN NO NEED TO HAVE RECOURSE TO THESE SUPPLIES. AT PRESENT IT IS SCARECELY POSSIBLE TO CREATE A SYSTEM WHICH WOULD ENSURE MONITORING ALL THE BODY "PARAMETERS". NOR IS THIS NECESSARY.

5/6 069 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0131963

ABSTRACT/EXTRACT--WHEN WE SPEAK OF IMPROVING MEDICAL MONITORING WE HAVE SOMETHING DIFFERENT IN MIND: STUDY OF THE CLASSIFICATION OR PHENOMENOLOGY OF PHENOMENA ASSICIATED WITH SPACEFLIGHT CONDITIONS, AND ESPECIALLY THE STATE OF WEIGHTLESSNESS. IT IS SCARECELY POSSIBLE TO STUDY A STATE OF "PURE" WEIGHTLESSNESS. DURING REAL SPACEFLIGHT ADDITIONAL FACTORS ARE SUPERPOSED ON IT, SUCH AS PSYCHIC, SENSATIONS OF THE CLOSED VOLUME OF THE SHIP, SMALL MOBILITY OF THE CREW, AND ITS SINGULAR ISOLATION. THE BODY ADAPTS TO THESE NEW CONDITIONS AND A SORT OF EQUILIBRIUM IS ESTABLISHED BETWEEN THE PHYSIOLOGICAL STATE OF MAN AND HIS ENVIRONMENT. ON THE BASIS OF AN ANALYSIS OF THE BODY REACTIONS TO THESE CONDITIONS IT IS POSSIBLE TO FORM SOME IDEA CONCERNING THE NORMAL STATE OF MAN DURING A PROLONGED FLIGHT, THAT IS, ABOUT HIS NORMAL "COSMIC" PULSE, RESPIRATION RATE, ETC. DEPENDING ON SUCH A UNIQUE SPACE "NORM," ONE CAN DETERMINE DEVIATIONS FROM IT. IN THE FUTURE IT WILL PROBABLY BE POSSIBLE TO GO EVEN FURTHER: AUTOMATE MEDICAL MONITORING. IN SUCH A CASE THE INFORMATION ON THE CONDITION OF THE COSMONAUT WILL BE SENT DIRECTLY TO A COMPUTER WHICH WILL MAKE THE DIAGNOSIS. Q. IS ANY SPECIAL MEDICAL MONITORING OF THE COSMONAUTS PLANNED AFTER LANDING OF "SOYUZ 9"? A. THE PROGRAM FOR POSTLFIGHT INVESTIGATIONS IS ALWAYS CORRELATED WITH THE SPECIFIC FLIGHT MISSIONS. IN THIS CASE IT WILL BE NECESSARY TO TRACE THE EFFECTS OF PROLONGED PRESENCE IN SPACE AND CLARIFY HOW THE COSMONAUTS WILL READAPT, THAT IS, AGAIN ADAPT TO TERRESTRIAL CONDITIONS.

UNCLASSIFIED

6/6 069 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0131963

ABSTRACT/EXTRACT--IT IS KNOWN FROM THE RESULTS OF MANY FLIGHTS THAT SUCH ADAPTATION IS ATTAINED AT A HIGHER PHYSIOLOGICAL "PRICE" THAN ADAPTATION TO WEIGHTLESSNESS. HOWEVER, AS A PREVENTIVE MEASURE THE COSMONAUTS HAVE PERFORMED A SPECIALLY DEVELOPED SET OF PHYSICAL EXERCISES IN ORBIT. THIS WILL UNDOUBTEDLY ASSIST THEM IN MORE RAPIDLY ADAPTING TO TERRESTRIAL CONDITIONS. Q. WHAT WILL THE "SOYUZ" FLIGHT YIELD FOR THE DEVELOPMENT OF SPACE BIOLOGY AND MEDICINE? A. MAN IS CAPABLE NOT ONLY OF REMAINING FOR A LONG TIME IN A STATE OF WEIGHTLESSNESS, BUT ALSO WORKING ACTIVELY, THAT IS, PERFORMING A GREAT VOLUME OF SCIENTIFIC AND TECHNICAL EXPERIMENTS. THIS IS THE FUNDAMENTAL CONCLUSION WHICH WE CAN DRAW EVEN NOW. THIS MEANS A NEW STAGE IN THE DEVELOPMENT OF SPACE MEDICINE. IT CAN ALSO BE PREDICTED THAT MAN IS ABLE TO MAKE EVEN LONGER SPACE VOYAGES. THE DATA WHICH WE ARE OBTAINING DURING THE COURSE OF THIS FLIGHT WILL MAKE POSSIBLE A SOUNDER APPROACH TO THE PROBLEM OF HOW NECESSARY IT IS TO USE SPECIAL MEANS FOR OVERCOMING THE EFFECTS EXERTED ON THE HUMAN BODY BY UNUSUAL LIVING AND WORKING CONDITIONS IN SPACE. FOR EXAMPLE, IS IT NECESSARY TO CREATE ARTIFICIAL GRAVITY ON A SPACESHIP OR AN ORBITAL STATION?

UNCLASSIFIED

2/6 058 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0110842

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. I HAVE TWICE HAD OCCASION TO BECOME ACQUAINTED WITH THE COMPUTERS SERVING THE FLIGHT OF SOYUZ-9. AT FIRST IT WAS A BLIND ACQUAINTANCE IN THE OPERATIONS AND TECHNICAL GUIDANCE ROOM. HERE THE DOCUMENT COMPILED BY THE COMPUTER IS DAILY REFLECTED. ON A BROAD PAPER TAPE WITH PERFORATIONS DOWN BOTH SIDES ARE NINE COLUMNS OF FIGURES. FROM THEM, BY FINDING THE RIGHT LINES, ONE CAN DETERMINE THE TIME OF THE SHIP'S RADIO VISIBILITY ON ONE TURN OR ANOTHER. AT THE TOP AND THE BOTTOM OF THE PAPER STRIP ARE MACHINE ENTRIES, AS ON A TECHNICAL DRAWING: EXECUTOR, COMPUTER, YEAR 1970, NUMBER, SIGNATURE. OF COURSE, THE SIGNATURE IS MADE WITH AN ORDINARY BALLPOINT PEN, THAT IS, BY A PERSON. BUT THIS IS THE ONLY VISIBLE SIGN OF HIS HAND. THE SECOND TIME I PAID A "VISIT" TO THIS MACHINE IN ITS OWN "APARTMENT", IN THE PREMISES IT OCCUPIES TOGETHER WITH THE CONTROL DESK AND WITH INPUT, OUTPUT, MEMORY, AND OTHER AUKILIARY DEVICES. THE COMPUTER IS COMPLETELY MODERN EVEN IN ITS EXTERNAL APPEARANCE: COMPACT AND PAINTED IN SOFT PASTEL SHADES. IT IS HOOKED UP TO A SPECIALIZED MACHINE IN THE NEXT ROOM ACROSS THE CORRIDOR. FROM THE PRINTING MECHANISM EMERGES THE BROAD PAPER TAPE, THE ONE WHICH WILL SOON APPEAR IN THE OPERATIONS AND TECHNICAL GUIDANCE ROOM. BEFORE PREPARING SUCH A TABLE, THE MACHINE MUST KNOW THE SHIP'S POSITION IN SPACE RELATIVE TO THE EARTH, ITS ORBIT, AND ALSO THE COORDINATES OF THE SURFACE MEASURING POINTS. THE VALUES OF THE ORBIT'S PARAMETERS ARE RECEIVED BY ANTENNAS FROM THE SHIP IN THE FORM OF ELECTRICAL IMPULSES.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--13NOV70

3/6 058

CIRC ACCESSION NO--AN0110842

ABSTRACT/EXTRACT--THIS INFORMATION IS INSTANTLY PROCESSED BY THE COMPUTER, AND A RESULTING, NUMERICAL PICTURE IS FORMED OF THE ZONES OF THE OBJECT'S RADIO VISIBILITY. FROM IT IT IS ALWAYS POSSIBLE TO FIND OUT ACCURATELY WHEN THE NEXT COMMUNICATIONS SCHEDULE WITH THE SOYUZ-9 CREW WILL TAKE PLACE. THE MANNED FLIGHT CONTROL CENTER HAS A POWERFUL COMPUTER COMPLEX AT ITS DISPOSAL. IT IS EQUIPPED WITH HIGH SPEED COMPUTERS AND SPECIALIZED MACHINES. "SEVERAL YEARS AGO", THE LEADER OF THE COMPUTER CENTER SAID, "WE USED THE COMPUTER TO CONTROL THE ANTENNAE WHICH FOLLOW MOVING OBJECTS. IT SERVED AS A BASIS FOR MASTERING MORE COMPLEX MATHEMATICAL PROGRAMS AND FOR TRAINING HIGHLY QUALIFIED CADRES. SUBSEQUENTLY, ON THIS BASIS MATHEMATICAL PROGRAMS WERE CREATED FOR THE CONTROL OF SPACECRAFT." THE COMPUTER CENTER SOLVES TWO MAIN TASKS. ONE CONSISTS OF PREPARING TARGET DESIGNATIONS FOR GROUND TELEMETRY STATIONS, THAT IS, DATA ON THE SPACECRAFT'S POSITION, SO THAT THE ANTENNAE CAN BE ACCURATELY TRAINED ON IT. THE OTHER TASK IS TO PROVIDE THE CHIEF OPERATIONS GROUP WITH ALL THE MATERIAL NECESSARY FOR FLIGHT CONTROL. IT IS WELL KNOWN THAT IN VARIOUS POINTS AND SYSTEMS ON THE SHIP MANY HUNDREDS OF SENSORS ARE INSTALLED; WITH THEIR HELP THE AIR PRESSURE IN THE COMPARTMENTS, TEMPERATURE, ANGULAR VELOCITIES OF MOVEMENT, OVERLOADS, AND OTHER PHYSICAL VALUES ARE MEASURED. WHEN THE SHIP ENTERS THE ZONE OF RADIO VISIBILITY OF A SURFACE POINT, THIS INFORMATION IS TRANSMITTED TO EARTH BY RADIO. THUS, EVERY SECOND, TENS OF THOUSANDS OF UNITS OF INFORMATION ARE "THROWN" OUT AND GO INTO THE COMPUTERS.

UNCLASSIFIED

4/6 058 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0110842

ABSTRACT/EXTRACT--THE PROCESSING OF THE INFORMATION TAKES PLACE AS IT IS RECEIVED, SIMULTANEOUSLY. THE COMPUTERS CARRY OUT A LOGICAL ANALYSIS OF THE FUNCTIONING OF VARIOUS ON BOARD SYSTEMS AND OF THE ASTRONAUTS' CONDITION AND FORECAST THE ORBIT. WITHOUT MODERN COMPUTERS MANNED SPACE FLIGHTS WOULD BE IMPOSSIBLE. "FOR THE FUTURE," THE COMPUTER CENTER LEADER CONTINUED, "WE PLAN THE FULL AUTOMATION OF SPACECRAFT CONTROL WITH THE HELP OF COMPUTER TECHNOLOGY. THE SOLUTION OF THIS PROBLEM IS OF GREAT IMPORTANCE FOR THE FURTHER DEVELOPMENT OF COSMONAUTICS. OF COURSE, THIS DOES NOT MEAN THAT EVERYTHING WILL BE DONE BY MACHINES "THEMSELVES." MAN'S WILL AND HIS MIND AND EXPERIENCE ARE IMPRINTED IN THE PROGRAMS THEY FOLLOW." I HAD JUST BEEN WATCHING THE WORK OF COMPUTERS, ONE OF THE WONDERS OF OUR AGE. RETURNING TO THE CONTROL ROOM, I ALSO SAW A PICTURE REMARKABLE FOR OUR TIMES. ON A HUGE TELEVISION SCREEN, COVERING ALMOST THE ENTIRE WALL, A HEATED SKIRMISH OF FOOTBALLERS WAS SEETHING. IT WAS A FOOTBALL MATCH BEING RELAYED FROM MEXICO. IT WAS BEING WATCHED BY SPECIALISTS AND SCIENTISTS WHOSE SHIFT HAD ENDED AND WHO, ONLY A FEW MINUTES AGO, HAD BEEN TALKING TO THE CREW OF THE SPACECRAFT, HELPING THEM TO CARRY OUT EXPERIMENTS. AND ANOTHER 4 HOURS LATER, ON SOYUZ-9'S 50TH ORBIT, COSMONAUTS A. G. NIKOLAYEV AND V. I. SEVASTYANOV REPLIED TO THE COLLECTIVE QUESTIONS OF A GROUP OF CENTRAL NEWSPAPER CORRESPONDENTS WHO WERE IN THE FLIGHT CONTROL CENTER. THE COSMONAUTS' VOICES SOUNDED AS CLEAR AS IF THEY WERE SOMEWHERE IN THE NEXT ROOM. THE COSMONAUTS WERE CLEARLY VISIBLE ON THE SCREEN. THE FIRST TO REPLY TO THE JOURNALISTS WAS A. G. NIKOLAYEV.

UNCLASSIFIED

5/6 058 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0110842

ABSTRACT/EXTRACT--QUESTION: ANDRIYAN GRIGORYEVICH, THIS IS YOUR SECOND SPACE FLIGHT. WHAT NEW SENSATIONS HAVE YOU EXPERIENCED? ANSWER: THE SENSATIONS ON THIS FLIGHT ARE THE SAME AS ON THE FIRST, THERE IS NOTHING NEW. QUESTION: COMPARE THE SATURATION OF THE PROGRAMS OF YOUR FIRST AND SECOND FLIGHTS. ANSWER: ON THE VOSTOK CRAFT THE FLIGHT PROGRAM WAS FAIRLY BROAD, BUT NOW IT IS MORE SATURATED. MANY SCIENTIFIC AND TECHNICAL, MEDICOBIOLOGICAL, AND OTHER EXPERIMENTS ARE BEING CARRIED OUT. QUESTION: YOU FLEW IN THE VOSTOK CRAFT. WHAT CAN YOU SAY ABOUT THE CONCENIENCES OF WORK ON BOARD THE SOYUZ, AND WHAT ARE THE POSSIBILITIES OF THIS CRAFT? ANSWER: COMPARED WITH THE VOSTOK, THE SOYUZ HAS GREAT ADVANTAGES. CONVENIENCES FOR WORK AND REST HAVE BEEN CREATED IN IT. NOW YOU CAN OBSERVE FOR YOURSELVES WHAT GOOD CONDITIONS FOR WORK AND REST THERE ARE IN THE CRAFT. THERE IS ROOM FOR YET ANOTHER PERSON IN HERE. IT IS A MULTISEAT CRAFT. THE SOYUZ HAS INSTRUMENTS AND EQUIPMENT WITH WHOSE HELP IT IS POSSIBLE TO CARRY OUT BROAD MANEUVERS AND TO MOVE CLOSE TO OTHER CRAFT. BUT OUR PROGRAM DOES NOT SET US THESE GOALS. OUR FLIGHT IS SOLO. THEN V. I. SEVASTYANOV ENTERED THE CONVERSATION. QUESTION: HOW QUICKLY DID YOU GET USED TO WEIGHTLESSNESS? HOW ARE YOU WORKING? ANSWER: I AM GRADUALLY GETTING USED TO WEIGHTLESSNESS. ON THE ONE HAND, IT SEEMS I HAVE ALREADY GOTTEN USED TO IT, BUT ON THE OTHER, VARIOUS UNEXPECTED THINGS SUDDENLY HAPPEN: MY ASSOCIATIONS ARE STILL EARTHLY, BUT THE SITUATION IS DIFFERENT. BUT I AM WORKING COMFORTABLY, WELL, BETTER THAN ON EARTH.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--13NOV70

6/6 058

CIRC ACCESSION NO--AN0110842

ABSTRACT/EXTRACT--IT IS TRUE THAT THE EXECUTION OF MANUAL OPERATIONS REQUIRES MORE TIME THAN UNDER EARTH CONDITIONS: EVERYTHING MUST BE SECURED WELL AND STOWED AWAY, AND MOVEMENTS MUST BE FOLLOWED MORE ATTENTIVELY. QUESTION: HOW FULLY ARE YOU SUCCEEDING IN UTILIZING YOUR TECHNICAL KNOWLEDGE ON THE FLIGHT? ANSWER: A DIFFICULT QUESTION. KNOWLEDGE IS NECESSARY TO CONTROL ALL COMPLEX DEVICES, MECHANISMS, AND MACHINERY. AND, OF COURSE, STILL MORE KNOWLEDGE IS NEEDED TO CONTROL SPACECRAFT. THE COMMANDER AND I POSSESS THE REQUIRED DEGREE OF KNOWLEDGE AND ARE ENDEAVORING TO USE IT TO SUCCESSFULLY FULFILL THE FLIGHT PROGRAM. A. G. NIKOLAYEV AND V. I. SEVASTYANOV THEN CONVEYED WARM GREETINGS TO THE JOURNALISTS AT THE FLIGHT CONTROL CENTER AND TO THE READERS OF THE NEWSPAPERS THEY REPRESENT. WHEN THIS SPACE INTERVIEW ENDED, THE HANDS ON THE CLOCK INDICATED 2322. THE FIFTH DAY OF THE SOYUZ-9 FLIGHT WAS BEGINNING.

UNCLASSIFIED

1/4 049 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--INFORMATION FROM ORBIT -U-

AUTHOR--SMIRNOV, V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PRAVDA, 9 JUNE 1970

DATE PUBLISHED--09JUN70

SUBJECT AREAS--SPACE TECHNOLOGY, BEHAVIORAL AND SOCIAL SCIENCES, NAVIGATION

TOPIC TAGS--MANNED SPACECRAFT, RADIO SIGNAL, COSMONAUT, RADIO COMMUNICATION/(U)SOYUZ 9 MANNED SPACECRAFT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3004/1687 STEP NO--UR/9012/70/000/000/0000/0000

CIRC ACCESSION NO--AN0113972

UNCLASSIFIED

2/4 049 UNCLASSIFIED PROCESSING DATE--13NOV7C

CIRC ACCESSION NO--AN0131972

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WE STOOD ON A PLATFORM SURROUNDED BY METAL HANDRAILS AND LOOKED DOWNWARD, AS IF FROM THE BALCONY OF A HIGH BUILDING. "HERE," SAID THE ENGINEER ACCOMPANYING US, "IS THE ENTIRE GROUND MEASUREMENT COMPLEX ENSURING CONTROL OF THE 'SOYUZ-9' FLIGHT. RIGHT BEFORE US, LIKE IN THE PALM OF THE HAND". THE LOW LYING BUILDINGS OF THE CENTER LOOKED FROM HERE LIKE FLAT MASSIVE CHESTS. AT THE RIGHT ROSE THE LATTICEWORK OF A RECEIVING ANTENNA. THE PARABOLIC DISH, 25 M IN DIAMETER, SEEMED TO WALTZ, ROTATING ABOUT ITS VERTICAL AXIS AND AT THE SAME TIME MOVING THROUGH THE SKY. THE RATE OF MOTION OF THE ANTENNAS, EXPLAINED THE ENGINEER, MAKE IT POSSIBLE TO TRACK SPACESHIPS WHICH ARE PRESENT IN HIGH AND LOW ORBITS. DIRECTLY BENEATH US WE COULD SEE THE GREEN ROOF OF THE BUILDING HOUSING THE LARGE ROOM CONTAINING EQUIPMENT FOR THE RECEPTION OF RADIO SIGNALS AND THEIR AMPLIFICATION. FARTHER ON, AS IF LINED UP WITH A RULER, ARE OTHER BUILDINGS FILLED WITH ELECTRONIC EQUIPMENT. THIS EQUIPMENT SEPARATES DIFFERENT TYPES OF RADIO SIGNALS AND DISTRIBUTES THEM TO THE REQUIRED "ADDRESSES" WHERE THEY ARE REGISTERED. LOOKING BACKWARD, WE SEE ON THE HORIZON ANOTHER ANTENNA, FOR THE TRANSMITTER, IN A BLUISH HAZE. IT IS USED IN DIRECTING RADIO COMMANDS TO THE SHIP AND IN ORDER FOR IT NOT TO INTERFERE WITH THE OTHER ANTENNAS IT HAS BEEN PLACED A GOOD TEN KILOMETERS AWAY. LATER I VISITED ONE OF THE STRUCTURES WHICH I HAD VIEWED FROM ABOVE. OUTWARDLY THERE WAS NOTHING REMARKABLE HERE: LONG ROWS OF METAL SHELVES HOLDING NUMEROUS ELECTRONIC UNITS AND ELEMENTS.

UNCLASSIFIED

3/4 049 UNCLASSIFIED PROCESSING DATE--13NOV7C

CIRC ACCESSION NO--AN0131972

ABSTRACT/EXTRACT--HOWEVER, IN VOLUME, RATE AND SMOOTHNESS OF OPERATION THESE SYSTEMS COULD BE COMPARED WITH GIANT ENTERPRISES ALONG WHOSE ASSEMBLY LINE THE MOST COMPLEX OBJECTS MOVE IN A CONTINUOUS FLOW. THE DIRECTOR OF THE GROUND MEASUREMENT COMPLEX AT THE CENTER TOLD ABOUT HOW THE SYSTEMS OPERATE. WHEN THE SHIP ENTERS THE ZONE OF RADIO VISIBILITY ITS TRANSMITTERS RADIATE TO THE ANTENNAS RADIO SIGNALS CARRYING INFORMATION OF DIFFERENT KINDS. THE INSTRUMENTS TO WHICH THEY ARE THEN FED OPERATE ON THE PRINCIPLE OF AN ELECTRONIC "FILTER". IT DISCRIMINATES SEVERAL COMPONENTS, TELEVISION, TELEMETRIC, AND TELEPHONIC (VOICE) INFORMATION FROM A MIXTURE OF RADIO WAVES OF DIFFERENT FREQUENCY. THUS, TELEVISION VIEWERS, FOR EXAMPLE, ARE ABLE TO SEE IMAGES OF COSMONAUTS AND HEAR THEIR VOICES. THE INSTRUMENTATION "DISCRIMINATING" THE TELEMETRIC INFORMATION MAKES IT POSSIBLE TO OBTAIN SIGNALS WHICH CHARACTERIZE THE ACTIVITY OF ALL SHIP SYSTEMS AND THE CONDITION OF THE CREW. THIS INFORMATION IS RECORDED ON A MAGNETIC TAPE OR GRAPHICALLY ON PAPER IN THE FORM OF CURVES AND FIGURES AND IS ALSO FED INTO A COMPUTATION CENTER FOR AUTOMATIC PROCESSING. FINALLY, THERE ARE ELECTRONIC FILTERS "SPECIALIZED" FOR DISCRIMINATING FROM THE TOTAL SIGNAL INFORMATION ON THE PARAMETERS OF SHIP MOTION. THIS INFORMATION IS ALSO IMMEDIATELY TRANSMITTED TO COMPUTERS WHICH COMPUTE THE ORBIT. THE RESULTS OF OPERATION OF THE COMPUTERS LIE ON THE TABLES OF SPECIALISTS FOR CAREFUL ANALYSIS. THE COURSE OF FURTHER OPERATIONS IS DETERMINED BY THE CENTER'S TECHNICAL OPERATIONS STAFF. THE ADOPTED DECISIONS ARE SENT THROUGH A CABLE IN THE FORM OF CODED COMMANDS TO THE TRANSMITTING STATION.

UNCLASSIFIED

4/4 049 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0131972

ABSTRACT/EXTRACT--AT A STRICTLY DETERMINED TIME A BUTTON IS PRESSED ON THE CONTROL PANEL AND RADIO COMMANDS ARE SENT TO THE SHIP. FIRST THEY ARE FED TO THE STORAGE UNITS AND ARE AGAIN RELAYED TO THE EARTH. ONLY AFTER THE CORRECTNESS OF THE REGISTERED COMMANDS IS CHECKED IS A SIGNAL SENT FOR THEIR EXECUTION BY ON BOARD AUTOMATIC DEVICES. "NOW," SAID THE DIRECTOR OF THE MEASURING COMPLEX IN CONCLUSION, "MANY OPERATIONS ARE PERFORMED INDEPENDENTLY BY THE COSMONAUTS THEMSELVES: COMPUTING THE SPATIAL POSITION OF THE SHIP, FIRING ENGINES FOR ORBITAL CORRECTION, PERFORMING VARIOUS EXPERIMENTS. IN SUCH CASES AUTOMATIC DEVICES ONLY CHECK THE ACTIONS OF COSMONAUTS, BACK THEM UP". HERE AGAIN IS THE COMMAND POINT WHERE INVISIBLE RADIO WAVES, EXPERIENCING MULTIPLE TRANSFORMATIONS, ACQUIRE A COMPLETELY GRAPHIC FORM. ON A SCREEN OCCUPYING ALMOST THE ENTIRE WALL OF THE HALL WE SEE THE SPACESHIP COMPARTMENT. THE IMPRESSION IS THAT THE COSMONAUTS ARE IN OUR MIDST, IN HTE HALL, LOOKING US IN THE EYE, AND CALMLY CHATTING. "HOW DID YOU SLEEP,?" ASKED THE OPERATOR. "GOOD. ONE CAN DOZE FOR 10 TO 15 MINUTES DIRECTLY IN THE AIR AT ANY TIME," RESPONDS V. I. SEVAST'YANOV. "AFTER THIS YOU FEEL FINE. I HAD A DREAM TODAY, BUT I CAN'T REMEMBER IT". "WAS THE DREAM IN COLOR"? "I DON'T REMEMBER, PROBABLY A SPACE DREAM". "ANDRIYAN, " WAS HEARD FROM THE GROUND, "YOU ARE THE PICTURE OF HEALTH, NOT AT ALL AS IF IN SPACE". "IS THAT GOOD OR BAD,?" ASKS A. G. NIKOLAYEV UNPERTURBED AS EVERYONE IN THE HALL LAUGHED. "GOOD LUCK, " ARE THEFINAL WORDS TRANSMITTED FROM THE EARTH TO THE COSMONAUTS.

UNCLASSIFIED

1/4 045 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--EARTH TALKS WITH THE FALCONS -U-

AUTHOR--SMIRNOV, V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PRAVDA, 4 JUNE 1970, P 2

DATE PUBLISHED--04JUN70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES, SPACE TECHNOLOGY

TOPIC TAGS--MANNED SPACECRAFT, SPACECRAFT CONTROL FACILITY, MANUAL, SATELLITE ORIENTATION, SATELLITE STABILITY, COSMONAUT/(U)SOYUZ 6 MANNED SPACECRAFT, (U)SOYUZ 7 MANNED SPACECRAFT, (U)SOYUZ 8 MANNED SPACECRAFT, (U)SOYUZ 9 MANNED SPACECRAFT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3004/1677 STEP NO--UR/9012/70/000/000/0002/0002

CIRC ACCESSION NO--AN0131970

UNCLASSIFIED

2/4 045 UNCLASSIFIED PROCESSING DATE--13NOV7(

CIRC ACCESSION NO--AN0131970

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ABOUT SEVEN AND A HALF MONTHS HAVE PASSED SINCE THE EXPERIMENTS WITH THE "SOYUZ-6", "SOYUZ-7" AND "SOYUZ-8" SHIPS. WHAT HAS CHANGED DURING THAT TIME AT THE MANNED SPACEFLIGHT CONTROL CENTER? IT CAN BE SEEN THAT THIS TIME THERE ARE FEWER SPECIALISTS: THE SERVICES MUST HANDLE ONLY ONE SHIP, NOT THREE. NEW TECHNICAL EQUIPMENT HAS APPEARED, WHICH IS ALSO ENTIRELY UNDERSTANDABLE: SPACEFLIGHT CONTROL IS BEING CONSTANTLY IMPROVED. THE NIGHTTIME LAUNCHING OF THE "SOYUZ-9" MADE A SINGULAR IMPRESSION ON THE ACTIVITY AT THE FLIGHT CENTER. EVERYTHING SEEMED UPSIDE DOWN: ALL THE SERVICES WERE WORKING AT NIGHTTIME, WHEREAS DURING THE DAYTIME, WHEN THE SHIP'S CREW WAS RESTING, ONLY A FEW PERSONS REMAINED ON DUTY. IT SEEMED TO ME ALSO THAT THE DAILY CONFERENCES OF THE TECHNICAL OPERATIONS STAFF BECAME STILL SHORTER BUT AT THE SAME TIME "MORE PACKED" WITH RESPECT TO QUANTITY OF INFORMATION. IN THE LARGE ROOM WHERE WE NOW ARE THE PRECISE TIME SIGNALS HAVE JUST SOUNDED; THEY ARE REPEATED EACH HALF HOUR. FOR SOME REASON OR ANOTHER THEY REMINDED ME OF THE RECENT VISIT TO THE WORLD SOCCER CHAMPIONSHIP: THE CLOCKS MOUNTED ON THE BOARD AT THE AZTEC STADIUM AT FIRST GIVE NOT ONLY THE MINUTES, BUT ALSO THE SECONDS. HERE AT THE CONTROL CENTER, HOWEVER, THE ACCURACY FOR MANY MEASUREMENTS IS TWO OR THREE ORDERS OF MAGNITUDE GREATER. FOR EXAMPLE, AT THE OPERATIONS CONFERENCE IT WAS STATED THAT THE ACCURACY IN IMPARTING THE BRAKING IMPULSE DURING THE FIRST CORRECTION WAS A HUNDREDTH OF A METER PER SECOND AND DURING THE SECOND CORRECTION, FOUR HUNDREDTHS OF A SECOND.

UNCLASSIFIED

3/4 045 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0131970

ABSTRACT/EXTRACT--"THIS ENSURED US A SATISFACTORY ORBIT," STATED THE LEADING EXPERT OF THE BALLISTICS GROUP. IN GENERAL, FROM THE POINT OF VIEW OF BALLISTICS, THE PROBLEMS IN THIS FLIGHT ARE NOT COMPLEX FOR US. IT IS MORE CONVENIENT FOR US TO 'WORK' WITH A NEARLY CIRCULAR ORBIT. IF IT IS OVAL THE SHIP WHEN AT PERIGEE IS SEVERELY BRAKED BY THE ATMOSPHERE AND "TOO SENSITIVE" AN ORBIT IS OBTAINED. IN ADDITION, THE ATMOSPHERE ITSELF EXPERIENCES SEASONAL VARIATIONS, IT LITERALLY 'BREATHERS'. THIS MUST ALSO BE TAKEN INTO ACCOUNT. NOW, IN JUNE, IT IS 'MORE LIQUID' THAN DURING MID WINTER, AND THIS MEANS THAT IT EXERTS A LESSER EFFECT ON THE ORBIT". WHILE WE CHATTED, THE TIME APPROACHED FOR THE NEXT COMMUNICATIONS CONTACT. ANALYSIS OF TELEMETRIC INFORMATION REVEALED THAT THE CONTENT OF CARBON DIOXIDE IN THE SHIP IS INCREASING MORE SLOWLY THAN DURING GROUND TRAINING. PHYSICIANS CONCLUDE THAT THE COSMONAUTS ARE NOT MOVING ABOUT ENOUGH. "WHAT ARE YOU DOING ABOUT PHYSICAL EXERCISES,?" THEY ASKED FROM THE GROUND. "WE CANNOT PERFORM THE FULL SCHEDULE, THERE'S NOT ENOUGHT TIME," RESPONDED A. G. NIKOLAYEV. THE FACT IS THAT PRIOR TO PHYSICAL EXERCISES THE COSMONAUTS MUST REMOVE THEIR USUAL WOOL SUIT AND PUT ON A SPECIAL WEIGHTED SUIT WHICH CREATES ADDITIONAL LOADS ON DIFFERENT MUSCLES. "HOW MUCH MUST BE ADDED,?" ASKS THE OPERATOR. "DROP SOME EXPERIMENTS IN ORDER TO INCREASE THE TIME ON PHYSICAL EXERCISES AND PREPARATIONS FOR THEM". A. A. LEONOV, DIRECTOR OF THE COSMONAUTS GROUP, WHICH CONDUCTS CONVERSATIONS WITH THE CREW, ANALYZES ITS WORK IN SPACE, COMMENTING ON THE FIRST DAYS OF FLIGHT: "THE COSMONAUTS FEEL WELL AND COMMUNICATION WITH THEM IS STABLE.

UNCLASSIFIED

4/4 045 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0131970

ABSTRACT/EXTRACT--I WAS A PARTICIPANT IS MANY LAUNCHINGS. FROM FLIGHT TO FLIGHT THE EFFICIENCY OF THE CONTROL SERVICES AND THEIR ORGANIZATION IMPROVE". BUT NOW THE TIMES HAS COME FOR "SOYUZ-9" TO REENTER THE ZONE OF "RADIO VISIBILITY". "TELL US, 'SOKOL-2' (THE CODE NAME FOR THE ON BOARD ENGINEER). HAVE YOU USED THE ELECTRIC RAZOR TODAY? "YES I TRIED IT OUT. WORKED OK. THE SAFETY RAZOR IS POORER". "HOW'S THE HEATER"/ "IT WORKS WELL AND WE HAD HOT COFFEE". "SOYUZ-9" CARRIED AN "ELECTRIC STOVE," A SPECIAL DEVICE WITH A HEATING SPIRAL. THE COSMONAUTS INSERT AN ALUMINUM TUBE WITH FOOD INTO THE STOVE, IT IS HEATED TO A STIPULATED TEMPERATURE, AND THE STOVE IS AUTOMATICALLY SWITCHED OFF. LATE IN THE EVENING A BRIEF CONVERSATION WAS HELD WITH THE CHIEF DESIGNER OF THE "SOYUZ" SHIPS. "THIS IS A WORKING, EXPERIMENTAL FLIGHT," HE STATED. "ONE OF ITS OBJECTIVES IS THE PERFECTING OF SYSTEMS WHICH WILL BE USED ON FUTURE SHIPS AND ORBITAL STATIONS; NEW SYSTEMS ARE ALSO BEING TESTED. ANOTHER OBJECTIVE IS DETERMINING THE OPTIMUM RELATIONSHIPS BETWEEN THE POSSIBILITIES OF MAN AND AUTOMATIC DEVICES. WE MUST DETERMINE THE POSSIBILITIES OF PURPOSEFUL HUMAN ACTIVITY IN SPACE, CREATING SUCH CONDITIONS THAT MAN CAN WORK THERE PURPOSEFULLY". "DURING THIS FLIGHT PROVISION IS MADE FOR MANY OPERATIONS WHICH COSMONAUTS PERFORM MANUALLY: MANUAL ORIENTATION AND SHIP STABILIZATION, INDEPENDENT NAVIGATION USING TERRESTRIAL LANDMARKS AND STARS. ALL THIS IS NECESSARY FOR FUTURE SPACE FLIGHTS," STATED THE CHIEF DESIGNER OF "SOYUZ" SHIPS IN CONCLUSION.

UNCLASSIFIED

1/3 029 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--MYSTERY OF THE DUST CLOUD -U-

AUTHOR--SMIRNOV, V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PRAVDA, 13 MAY 1970, P 3

DATE PUBLISHED--13MAY70

SUBJECT AREAS--SPACE TECHNOLOGY, ATMOSPHERIC SCIENCES

TOPIC TAGS--DUST, COSMIC DUST, SPACECRAFT CARRIED EQUIPMENT, PRESSURE SENSOR, ARTIFICIAL EARTH SATELLITE/(U)COSMOS 135 SATELLITE, (U)COSMOS 163 SATELLITE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3004/1710 STEP NO--UR/9012/70/000/000/0003/0003

CIRC ACCESSION NO--AN0131980

UNCLASSIFIED

2/3 029 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0131980

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SATELLITE MEASUREMENTS IN EARTH ORBITS HAAD GIVEN RISE TO THE WIDELY ACCEPTED HYPOTHESIS THAT THE EARTH IS SURROUNDED BY A DUST CLOUD. FLIGHTS TO THE MOON, VENUS AND MARS INDICATED A VERY LOW DUST CONTENT AT GREAT DISTANCES FROM THE EARTH. IN 1966 SPECIALISTS AT THE PHYSICAL TECHNICAL INSTITUTE IN LENINGRAD BEGAN TO DOUBT THE EXISTENCE OF A CIRCUMTERRESTRIAL DUST CLOUD. THEY THEREFORE INSTALLED SPECIAL INSTRUMENTS ABOARD A SATELLITE WHICH DIFFERED FROM THOSE USED EARLIER AND WHOSE READINGS WERE THE BASIS FOR THE DUST CLOUD HYPOTHESIS. THE SENSORS OF ONE INSTRUMENT, AS USUAL, WERE ATTACHED DIRECTLY TO THE SATELLITE BODY, WHEREAS TWO OTHER PRESSURE SENSTIVITY ELEMENTS WERE MOUNTED ON A SPECIAL EXTENSIBLE PANEL. ATTACHMENT OF THE PANEL GUARANTEED A GOOD SONIC INSULATION FROM THE SATELLITE, WHOSE "NOISE" COULD NOT BE PICKED UP BY THE PRESSURE SENSITIVE ELEMENTS. "NOISE" OF THE PLATE WITH THE DETECTOR WAS REDUCED TO A MINIMUM BY ITS DESIGN. "KOSMOS-135," CARRYING SUCH INSTRUMENTATION, WAS LAUNCHED IN LATE 1966. FIVE DAYS ELAPSED BEFORE ANY SIGNALS WERE REGISTERED BY THE INSTRUMENTS ON THE PANEL. IT WAS KNOWN THAT THE INSTRUMENTATION WAS OPERATIVE BECAUSE SEVERAL TIMES A DAY THE IMPACT OF A PARTICLE AGAINST THE PANEL WAS SIMULATED. FINALLY, INDIVIDUAL SIGNALS OF PARTICLE IMPACTS WERE RECEIVED AT 10-20 DAY INTERVALS. THE DETECTORS ON THE SATELLITE BODY REGULARLY REGISTERED IMPACTS. MOST OF THE REGISTERED EVENTS COINCIDED WITH THE TIME WHEN THE SATELLITE ENTERED THE EARTH'S SHADOW. IT WAS FOUND THAT THESE WERE CRACKLINGS OF THE VEHICLE, NOT PARTICLE IMPACTS.

UNCLASSIFIED

3/3 029 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0131980

ABSTRACT/EXTRACT--UNDER THE INFLUENCE OF COSMIC COLD, THE VEHICLE WHICH HAD JUST BEEN EXPOSED TO INTENSE SOLAR HEAT, COOLED RAPIDLY, SUBJECTING PARTS TO STRESSES. THE CRACKLINGS WERE PICKED UP BY THE HIGHLY SENSITIVE ACOUSTIC INSTRUMENTS. THE SENSORS ON THE BODY ALSO UNDOUBTEDLY COULD PICK UP THE CLICKING OF SWITCHES, COMMUTATORS AND RELAYS. THE FIRST SCIENTIFIC REPORTS ON THIS EXPERIMENT WERE COUCHED IN CAUTIOUS LANGUAGE: "THE EXISTENCE OF A DUST CLOUD AROUND THE EARTH CANNOT BE CONSIDERED ESTABLISHED". BUT THE EXPERIMENT WAS REPEATED ABOARD "KOSMOS-163" WITH THE SAME RESULTS AND THE SIMULATION OF THE EXPERIMENT IN THE LABORATORY PROVIDED FURTHER CONFIRMATION.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--30OCT7

1/4 034

TITLE--MODEL OF THE VENUSIAN ATMOSPHERE -U-

AUTHOR--SMIRNOV, V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PRAVDA, 23 MAY 1970, P 3

DATE PUBLISHED--23MAY70

SUBJECT AREAS--ASTRONOMY,ASTROPHYSICS

TOPIC TAGS--VENUS PLANET, PLANETARY ATMOSPHERE, SPECTROGRAPH, ATMOSPHERIC MODEL/(U)VENUS 5 VENUS PROBE, (U)VENUS 6 VENUS PROBE, (U)VENUS 4 VENUS PROBE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0726 STEP NO--UR/9012/70/000/000/0003/0003

CIRC ACCESSION NO--AN0129886

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--30OCT

2/4 034
CIRC ACCESSION NO--AN0129886
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WORK OF THE THIRTEENTH COSPAR SESSION IS CONTINUING IN LENINGRAD. SYMPOSIUM IS NOW BEING HELD THERE ON REMOTE SOUNDING OF THE ATMOSPHERE FROM SATELLITES. ON FIRDAY 22 MAY A SESSION OF WORKING GROUPS ON A NUMBER OF PROBLEMS IN SPACE RESEARCH ALSO BEGAN IN LENINGRAD. AN IMPORTANT PLACE IN STUDIES OF THE MOON AND PLANETS IS PLAYED BY AUTOMATIC LABORATORIES. THIS WAS MADE CLEAR, IN PARTICULAR, IN A REPORT BY THE SOVIET SCIENTISTS V. AVDUYEVSKIY, M. MAROV AND M. ROZHDESTVENSKIY ENTITLED "THE VENUSIAN ATMOSPHERE ACCORDING TO RESULTS OF MEASUREMENTS BY 'VENERA 5' AND 'VENERA 6'." ON THE BASIS OF SUCH DIRECT MEASUREMENTS, WHICH WERE INITIATED BY "VENERA 4," THE FIRST AUTOMATIC PROBE TO REACH ANOTHER PLANET, IT WAS POSSIBLE TO COMPUTE A MODEL OF THE VENUSIAN ATMOSPHERE FROM THE SURFACE TO 300 KM ABOVE THAT LEVEL. ALLOWANCE WAS MADE FOR THE RESULTS OF INVESTIGATION BY THE AMERICAN MARINER 5. THE MODEL IS IN THE FORM OF TABLES WHICH GIVE THE VERTICAL DISTRIBUTION OF TEMPERATURE, PRESSURE AND OTHER PHYSICAL CHARACTERISTICS. THE APPENDED GRAPH WITH SEVERAL CURVES INDICATES THAT THE "MORNING STAR" IS EXTREMELY INHOSPITABLE. THE MEAN TEMPERATURE AND PRESSURE AT ITS SURFACE ARE 500DEGREES AND 100 ATMOSPHERES. UNDER THESE CONDITIONS GAS DENSITY IS 100 TIMES LESS THAN THE DENSITY OF WATER. WHAT ARE THE CURRENT POINTS OF VIEW CONCERNING THE NATURE OF THE VENUSIAN ATMOSPHERE? I ASKED THIS QUESTION OF M. YA MAROV, WHO WAS ABOUT TO GIVE A REPORT. HE STATED: "FROM THE RESULTS OF DIRECT MEASUREMENTS WE KNOW THAT THE VENUSIAN ATMOSPHERE HAS A RATHER COMPLEX STRUCTURE.

UNCLASSIFIED

3/4 034 UNCLASSIFIED PROCESSING DATE--30OCT

CIRC ACCESSION NO--AN0129886

ABSTRACT/EXTRACT--WITH RESPECT TO THE VERTICAL DISTRIBUTION OF PARAMETER IT RESEMBLES OUR OWN ATMOSPHERE, BUT NATURALLY THE VALUES OF THESE PARAMETERS ARE COMPLETELY DIFFERENT. THIS IS EVIDENTLY THE RESULT OF DIFFERENT EVOLUTIONARY PROCESSES TRANSPIRING ON THE PLANET. ACADEMICI A. P. VINOGRADOV HAS GIVEN A QUITE CONVINCING PICTURE OF THESE PROCESSES. ACCORDING TO HIS HYPOTHESIS, THE CLOSENESS OF THE PLANET T THE SUN PREDETERMINED AN INTENSIVE TRANSFORMATION OF CARBONATES INTO SILICATES WITH RELEASE OF GREAT QUANTITITES OF CARBON DIOXIDE INTO THE ATMOSPHERE. "THEORETICAL ESTIMATES LEAD TO THE CONCLUSION THAT THE VENUSIAN ATMOSPHERE, PRESENT BENEATH A DENSE GAS 'OVERCOAT,' WITH AN INCREASE IN TEMPERATURE AND PRESSURE, ACCUMULATED MORE AND MORE HEAT. IT CAN BE POSTULATED THAT THE GRADUAL HEATING ALSO FINALLY LED TO A STABLE STATE IN THE ATMOSPHERE WHICH CORRESPONDS TO THE OBSERVED HIGH TEMPERATURE AND PRESSURE." "MEASUREMENTS MADE BY AUTOMATIC PROBES HA MADE IT POSSIBLE TO MAKE COMPUTATIONS OF THE TRANSFER OF RADIANT ENERG IN THE PLANETARY ATMOSPHERE. THEY CONFIRM THE POSSIBILITY OF SUCH A MECHANISM." "THE VENUSIAN CLOUDS, WHICH UNDOUBTEDLY EXERT AN IMPORTA EFFECT ON FORMATION OF THE HEAT REGIME OF THE PLANETARY ATMOSPHERE, AR OF ENORMOUS INTEREST. UNFORTUNATELY, AT THE PRESENT TIME LITTLE IS KNOWN CONCERNING THEIR NATURE. SPECTROGRAMS OF THE GAS ENVELOPE OF VENUS SHOW THAT IN ADDITION TO CARBON DIOXIDE, WATER VAPOR AND A SMALL QUANTITY OF OXYGEN, IT CONTAINS VERY INSIGNIFICANT ADMIXTURES OF OTHER CHEMICAL COMPOUNDS.

UNCLASSIFIED

4/4 034 UNCLASSIFIED PROCESSING DATE--30OCT

CIRC ACCESSION NO--AN0129886

ABSTRACT/EXTRACT--ON THIS BASIS SOME SCIENTISTS ADVANCE THE HYPOTHESIS O MULTILAYER CLOUDS, INCLUDING SUCH "EXOTIC" SUBSTANCES AS MERCURY, IRON CHLORIDE AND AMMONIUM CHLORIDE, AND MAGNESIUM HYDRATE. IT IS ALSO IMPOSSIBLE TO COMPLETELY REFUTE THE HYPOTHESIS OF "DUST CLOUDS, PARTICULARLY IF ONE BEARS IN MIND THE POSSIBILITY FO AN INTENSIVE MIXI OF GAS LAYERS AT THE RED HOT PLANETARY SURFACE, TOGETHER WITH THE ABSENCE OF PRECIPITATION, WHOSE FALLING PURIFIES TERRESTRIAL AIR." "NEVERTHELESS, IT IS MOST PROBABLE THAT THE VENUSIAN CLOUDS CONSIST OF WATER CRYSTALS LESS THAN ONE OR TWO MICRONS IN DIAMETER. AS IS WELL KNOWN, MOISTURE IS CONDENSED AT A DEFINITE TEMPERATURE, THE DEQ POINT. THE WATER VAPOR CONCENTRATION MEASURED BY SOVIET AUTOMATIC PROBES WAS USED IN COMPUTING THE ALTITUDE OF WATER CLOUDS, WHOSE THICKNESS CAN ATTAIN 5-10 KILOMETERS. IN SUCH CASES THEIR LOWER BOUNDARY IS AT AN ALTITUDED OF APPROXIMATELY 60 KM FROM THE PLANETARY SURFACE." "IT IS IMPORTANT TO EMPHASIZE," STATED M. YA. MAROV IN CONCLUSION, "THAT THE WATER VAPOR CONTENT DETERMINED BY INSTRUMENTS ON AUTOMATIC PROBES MAKE IT POSSIBLE TC SURMISE THE EXISTENCE OF WATER CLOUDS REGARDLESS OF WHETHER OR NOT CONDENSATES OF A DIFFERENT NATURE EXIST IN THE ATMOSPHERE. IF THE AIR ENVELOPE CONTAINED ONLY CARBON DIOXIDE IT WOU BE DIFFICULT TO EXPLAIN ITS HEAT REGIME. WITH RESPECT TO THE PROBLEM WHY VENUS DIFFERS SO SURPRISINGLY FROM THE EARTH AND OTHER PLANETS OF THE EARTH GROUP, SCIENCE STILL HAS NO ANSWER.".

UNCLASSIFIED

1/2 040 UNCLASSIFIED

TITLE--GROUND TALKS WITH FALCONS -U- PROCESSING DATE--11SEP70

AUTHOR--SMIRNOV, V.

COUNTRY OF INFO--USSR

SOURCE--PRAVDA, JUNE 4, 1970, P 3, COLS 2-8

DATE PUBLISHED--04JUN70

SUBJECT AREAS--SPACE TECHNOLOGY

TOPIC TAGS--MANNED ORBITAL LABORATORY, UNMANNED ORBITAL LABORATORY, MANNED SPACECRAFT, MAN MACHINE SYSTEM/(U)SOYUZ 9 MANNED SPACECRAFT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1173 STEP NO--UR/9012/70/000/000/0003/0003

CIRC ACCESSION NO--AN0104539

UNCLASSIFIED

2/2 040 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AN0104539

ABSTRACT/EXTRACT--(U) GP-0- DURING AN INTERVIEW AT THE FLIGHT CONTROL CENTER, THE CHIEF DESIGNER OF THE "SOYUS" SHIPS STATED THAT THE MISSION OF THE "SOYUZ 9" IS "WORKING" AND "EXPERIMENTAL" IN NATURE, AND THAT ONE OF ITS TASKS IS TO CHECK OUT SYSTEMS WHICH WILL BE USED ON SHIPS AND ORBITAL STATIONS IN THE FUTURE AND ALSO TO TEST NEW SYSTEMS. ITS OTHER TASK IS TO DETERMINE THE OPTIMUM RELATIONSHIP BETWEEN MAN AND AUTOMATA.

UNCLASSIFIED

USSR

Optical

UDC: 621.378.8

KRIVOSHCHEKOV, G. V. and SMIRNOV, V. A.

"Excitation of Ultrashort Light Pulses With Stable Parameters in a Laser With Active Modulation"

Moscow, Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, No 2, 1973, pp 163-164

Abstract: Although the formation of ultrashort light pulses by mode synchronization in a laser with clear filters is a widely used method, it impedes the reproduction of the pulse parameters. The authors analyze the process of mode synchronization by external resonance modulation of the laser Q, and show that this method is better able to form ultrashort light pulses with stable parameters. A ruby laser system in ring formation capable of realizing this process is shown in schematic form; it involves an electrooptical gate with an $LiNbO_3$ crystal to which a sinusoidal voltage whose half-period is equal to the bypass time of the resonator pulse is applied. The dependence of the pulse parameters on the linear generation time of the pulse is investigated. The authors thank N. G. Nikulin and V. M. Semibalamut for their assistance.

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USSR

UDC 533.9.07

MOROZOV, A. I., NEVROVSKIY, V. A., and SMIRNOV, V. A.

"Investigating Forced Oscillations of a Plasma Potential in an Accelerator With Closed Electron Drift"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 3, 1973, pp 535-542

Abstract: It is noted that closed electron drift plasma accelerators with extended zones of ion acceleration are known in American science literature as linear Hall accelerators. The present paper gives the results of experimental work in the investigation of the response of the accelerator plasma to an external perturbing signal which is regular in time and is varied in frequency from 30 to 800 kHz. The following characteristic reactions of the plasma were noted in the experiments: the dependence of the amplitudes of the forced oscillations on the amplitude of the forcing signal and its frequency (the amplitude-frequency characteristic of the plasma space); the amplitude distribution of the signal in the accelerator channel; the phase delay of the harmonic signal in its passage through the plasma (the phase-frequency characteristic). A cross-sectional diagram of the experimental accelerator is given; its basic principle of operation was described in an earlier article

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USSR

MOROZOV, A. I., et al., Zhurnal Tekhnicheskoy Fiziki, No 3, 1973, pp 535-542

(G. Janes and J. Dotson, in the book Prikladnaya magnitnaya gidrodinamika -- Applied Magnetic Hydrodynamics -- "Mir," Moscow, 1965, p 235). The authors thank G. Ya. Shchepkin for his assistance in organizing the experiments, and Yu. V. Yesipchuk and A. M. Kapulkin for discussing the experimental results.

USSR

UDC 533.9.07

MOROZOV, A. I., NEVROVSKIY, V. A., and SMIRNOV, V. A.

"Action in the Plasma Flow in a Closed Drift Accelerator System With Feedback"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 3, 1973, pp 543-549

Abstract: In a closed drift accelerator system undesirable perturbations of the plasma parameters are observed. The purpose of the experiments described in this paper is to investigate the applicability of a simple feedback system for damping out these perturbations. The system consists of a device for sensing the perturbations, a band filter, a delay line, voltage and power amplifiers, and a control electrode. Circuits of the entire control system and the sensing device used to measure the ion current oscillations in the channel are given. The experiments done with this equipment are described, and oscillograms showing the effects on the plasma perturbations by the feedback system are produced. While complete suppression of the perturbations could not be realized, the experiments demonstrated that stabilization of the perturbations was possible.
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USSR

UDC: 621.373.018.756

KRIVOSHCHEKOV, G. V., NIKULIN, N. G., SMIRNOV, V. A., and SOKOLOVSKIY, R. I.

"Transient Process in a Laser With Active Modulation"

Novosibirsk, Avtometriya, No 5, 1972, pp 113-119

Abstract: An analysis is made of the transient process in lasers with active modulation of the losses involved in the excitation of ultrashort light pulses. The traveling wave laser, in which the ensemble of two-level atoms with uniformly expanded amplification lines is used as the model for the active medium, is examined. With the dispersion assumed to be negligible, the pulse variation occurs in the active medium and the modulator. The transmission of the light pulse through the medium at carrier frequency resonance is then described by a system of three equations. These are solved and an expression for the radiation intensity is derived. The computations show that linear compression is basically responsible for shortening the pulse duration. Experiments to check the effect of the linear oscillation development time on the pulse duration were conducted, and a diagram of the apparatus plus an

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USSR

UDC: 621.373.018.756

KRIVOSHCHEKOV, G. V., et al, Avtometriya, No 5, 1972, pp 113-119

explanation of the procedure is given. Oscillograms of the oscillation pulses and an ultrashort pulse with a width of $6 \cdot 10^{-10}$ s are reproduced.

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USSR

UDC 621.375.82

BONDARENKO, A. N., KRIVOSHCHEKOV, G. V., SMIRNOV, V. A.

"Pulsed Sources of Coherent Pumping for Nonlinear Optical Systems"

V sb. Nelineyn. protsessy v optike (Nonlinear Processes in Optics--collection of works), vyp. 2, Novosibirsk, 1972, pp 377-391 (from RZh-Fizika, No 12, Dec 72, Abstract No 12D896)

Translation: A survey was made of the methods of stabilizing and tuning the radiation frequency of solid state lasers used as pumping sources in nonlinear optical systems. A comparative analysis was made of the advantages of using Fabry-Perot interferometers, anisotropic plates, and prism selectors in lasers operating in the free oscillation mode. The complexity of selecting modes in lasers operating in the modulated Q-factor mode as a result of the high magnitude of the amplification was noted. A great deal of attention has been given to the operation of lasers in the modulated Q-factor mode under the effect of a narrow-band, external signal. The bibliography has 26 entries.

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USSR

UDC: 621.391.8

GORYAINOV, V. T., SMIRNOV, V. A., and KHOKHLOV, V. N.

"Immunity to Correlated Noise in Binary Signal Reception"

Kiev, Izvestiya VUZ SSSR--Radioelektronika, No 9, 1972, pp 1077-1087

Abstract: The assumption is made that a combination of useful signal and noise is input to a receiver, the noise being stationary, normal, and quasiharmonic, with an average value of zero and specified dispersion and correlation function. A simple algorithm for optimizing the processing of the input signal is obtained, and the structure of the optimal receiver for this signal is defined. The block diagram corresponding to this structure is reproduced. Formulas are developed for calculating the probability of erratic reception of binary signals, and some particular cases are examined. A comparison is made between an optimal receiver for signals in a background of correlated noise and an optimal receiver for white noise when the signal is in a correlated noise background.

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SMIRNOV, V.A.

mechanical engineering

CONTACTLESS METHOD OF MEASURING VELOCITY OF IMPACTING ELEMENTS

Yu. M. Vasil'yev, A. V. Mikhaylov, Yu. K. Skvortsov, V. A. Smirnov

The essence of the method being studied is that the cavity in a body, which the impacting element moves is excited at the corresponding wave length λ_0 as a high-frequency cavity resonator, retuned periodically as the corresponding element moves due to the change in longitudinal size of the resonator, and the frequency of retuning of the resonator is recorded. The resonance occurs for a cylindrical cavity resonator at moments when the length of the resonator is equal to a whole number of half waves $\lambda_b/2$, where:

λ_b is the wave guide number of the wave in the cylinder, which is analyzed as a circular wave guide;

λ_{cr} is the critical wave length for the type of wave selected.

The frequency of retuning of the cylindrical cavity resonator F (1/time between neighboring resonant peaks) depends on λ_b and the rate of motion of the impacting element V:

$F = \frac{V}{2\lambda_b}$

Recording frequency F allows us to find the distribution of velocity on the path of the impacting element.

Figure 1 shows the diagram of measurement of the velocity of the impacting element in an air burner. Impacting element 2 moves in body 1, changing the length of the cavity resonator 3, which is excited at wave length $\lambda_0 = 8$ mm as a cylindrical cavity resonator by circular wave guide 4, passing through the insert 5 and fed by generator 6 through attenuator 7 and guiding tap 8. Inset 5 is inserted into

Figure 1. Block Diagram of Measuring Installation.

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USSR

UDC 619-036.22-022.9:[598.2+595.42

BEKLESHOVA, A. Yu., SMIRNOV, V. A., and TERSKIKH, I. I., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR

"Role of Seabirds and Their Ectoparasites in the Epizootic Process"

Moscow, Voprosy Virusologii, No 5, 1971, pp 596-600

Abstract: A study was conducted of the prevalence of ornithosis and arbovirus infection among kittiwakes (Rissa tridactyla) and guillemots (Uria aalge Pontopp and Uria lomoia) on Kharlov and Kuvshin islands in the Barents Sea at the beginning and end of the nesting period in 1966-1967. Attention was focused on the relationship between the seasonal activity and abundance of the tick Ceratixodes putus Pick.-Cambr. and the spread of ornithosis and encephalitis among the birds. The kittiwake is the main host of the tick and less susceptible to arboviruses. The guillemot, on the other hand, is more susceptible because its contacts with the tick are less constant.

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SMIRNOV, V.A.

Gallium Arsenide

JPRS 54673

10 December 1971

EFFECT OF TEMPERATURE AND THERMAL STRESS FIELDS ON THE FORMATION OF THE DISLOCATION STRUCTURE IN SINGLE CRYSTALS OF GALLIUM ARSENIDE GROWN BY THE CZOCHRALSKI METHOD

[Article by N. A. Avdonin, S. S. Vakhrameyev, M. G. Mil'vidskiy, V. B. Osvenskiy, Corresponding Member of the USSR Academy of Sciences, B. A. Sakharov, V. A. Smirnov, Yu. F. Shchelkin, State Scientific Research and Planning and Design Institute of the Rare Metal Industry; Moscow, Doklady Akademii Nauk SSSR, Russian, Vol 200, No 2, 1971, submitted 30 April 1971, pp 316-319]

Dislocations in single crystals grown from a melt are formed basically under the effect of thermal stresses arising during cooling of the ingot during the process of its growth. If these stresses exceed the critical shear of the material at the corresponding temperature, they cause plastic flow which partially or completely removes the thermal stresses. Consequently, the density distribution of the dislocations in the crystal must be determined by the thermal stress field in the temperature range of the plastic material.

However, up to now analysis of the conditions of formation of the dislocation structure of single crystals grown from a melt has reduced essentially to establishment of the empirical relation of the dislocation density to the magnitude of the temperature gradients in the vicinity of the crystallization front. Here, the defining role was attributed either to the radial [1] or the axial [2-4] components of the temperature gradient. The problem of the volumetric stressed state in the crystal was not considered in these works as a result of the great mathematical difficulties of solving it.

In this paper, a new approach to solving the problem has been used the schematic of which consists in the fact that the temperature field is calculated on a computer considering the boundary conditions obtained experimentally after which the thermoelastic stress field is calculated. The volumetric distribution of the thermoelastic shear stresses obtained in this way compare with the corresponding values of the yield stresses for gallium arsenide determined from independent experiments. This approach permits analysis of the conditions of formation of dislocations in the crystal growth process.

Single crystals of gallium arsenide were grown from under a layer of molten boron anhydride in the [111] direction. The temperature distribution in the crystal was fixed by tungsten-rhenium thermocouples 0.2 mm in diameter

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