89320
S/033/61/038/001/003/019
E032/E514

Results of a Statistical Study of Geomagnetic Disturbances for Five Cycles of Solar Activity

Table 1

No. of cycle	Period investigated	Number of Plages Used I	II_u	II_f	Remarks
14	I.1906-VI.1910	158	152	-	Most of the plages obtained from the Kodaikanal and some from the Meudon Observatories. Active regions belonging to Group II_u were largely taken from Zô-Sè Observatory data (Reg.8); some were taken from the Meudon data
15	III.1919-I.1922	165	239	93	Most plages from the Meudon data, remainder from Kodaikanal and Mount Wilson data
16	IX.1929-VIII. 1931	118	195	71	Necessary information given in Ref.9.

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Cont.on next card

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Results of a Statistical Study of Geomagnetic Disturbances for Five Cycles of Solar Activity

Table 1 cont.

No. of cycle	Period investigated	Number of Plages Used I	II u	II f	Remarks
17	II.1940-III.1943	239	186	58	Most plages taken from Meudon data, remainder from Kodaikanal and Mount Wilson data.
18	VI.1951-XI.1952	75	111	63	Necessary information given in Ref.9.
Total	I.1906-XI.1952	755	883	285	

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Results of a Statistical Study of Geomagnetic Disturbances for Five Cycles of Solar Activity

In order to reduce the effect of flares (high activity) and disturbances with anomalously long duration ΔT (lowest activity), only those sections of the descending activity curves are considered for which the relative sunspot number R is $15\text{-}20 \leqslant R \leqslant 75$. The plages are divided into two groups as follows:
Group I. Plages which during the CMP crossed the visible centre of the disc or were adjacent to the centre.
Group II. Plages with heliocentric angles $\psi_o \geqslant 6°$.
Group II is further sub-divided into two sub-groups II_u and II_f, which contain plages in the "unfavourable" and "favourable" hemispheres. The grouping is illustrated in Fig.1. The overall results for the whole period are given in Figs. 6 and 7, where Fig.6 refers to cycles Nos. 14, 15, 16 and 18 and Fig.7 to Nos. 14, 15, 16, 17 and 18. The general conclusion is the maximum on the right of CMP. The probability that the maximum on the right is accidental

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Results of a Statistical Study of Geomagnetic Disturbances for Five Cycles of Solar Activity

is very small (this is said to be established in a paper in a forthcoming issue of this journal). It is suggested that these results confirm previous conclusions of the present author, namely, that the active regions themselves are the sources of corpuscular streams responsible for M-disturbances (Refs. 1,2,6) and that these streams are approximately radial (O. N. Mitropol'skaya, Ref.9). This conclusion is in agreement with recent radio and polarization data (W. Christiansen and D. Mathewson, Ref.22; W. Christiansen, A. Boischot, T. Kakinuma, H. Dodson-Prince, Ref.23; G. Newkirk, Ref.24; J. Wild, K. Sheridan, A. Neylan, Ref.25). It is argued that the negative correlation between active regions and geomagnetic disturbances postulated by J. C. Pecker and W. O. Roberts (Ref.21) meets with serious difficulties. Among the arguments put forward against this hypothesis are the following: a) In distinction to the very stable maximum on the right, which is present in all the statistical curves, the points to the left of CMP are very irregular. b) Radio and polarization data (as mentioned above) are in conflict with this hypothesis. c) Statistical

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curves for plages with and without spots are practically identical (O. N. Mitropol'skaya, Ref 4). d) Photographs taken during solar eclipses show the presence of intense straight coronal rays at the base of plages (Ye. Ya. Bugoslavskaya, Ref.30).

Acknowledgments are expressed to the personnel of the Meudon, Kadaikanal and Mount Wilson Observatories for supplying the data and to A. D. Grishin and S. Vlasov for assistance in the numerical calculations. There are 8 figures, 2 tables and 32 references: 19 Soviet and 13 non-Soviet.

ASSOCIATION: Astronomicheskiy sovet Akademiya nauk SSSR
(Astronomical Council, Academy of Sciences, USSR)

SUBMITTED: August 20, 1960

Card6/9

S/033/61/038/002/003/011
E032/E414

3.1800 (1041, 1062, 1178, 1121)

AUTHORS: Mustel', E.R. and Ayvazyan, S.A.

TITLE: Quantitative Analysis of Statistical Relations Between Plages and M-Disturbances

PERIODICAL: Astronomicheskiy zhurnal 1961 Vol.38, No.2, pp.227-241

TEXT: In a previous paper (Ref.1) the first of the present authors carried out a statistical study of M-disturbances for five cycles of solar activity It was concluded that, for plages belonging to group I, the only stable formation on all the statistical curves considered in Ref 1 is the right-hand maximum. The aim of the present paper is to give a statistical analysis of the results derived in Ref 1 using modern methods of the theory of probability and mathematical statistics The principal aim is to show that the right-hand maximum in the statistical curves plotted for group I is not a random statistical formation but is real. It is concluded that the geomagnetic field associated with "non central" plages is time independent (on the average) while the mean strength M-disturbances in the case of "central" plages varies with time in accordance with a definite and stable law.

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Quantitative Analysis ..

This dependence can be approximately represented by two straight lines with a maximum at $t \approx +6^d$. A typical curve of this type is shown in Fig.3. This figure refers to group I: circles are experimental and the dashed curve is the theoretical fit. The probability that the form of the curve is as shown by the dashed curve in Fig.3 rather than random variation about a mean is 3.1×10^9. Variance analysis, χ^2 test, regression analysis, method of least squares etc, are used to confirm, and give a statistical basis for, the conclusions drawn in Ref.1. It is now definitely established that the passage of plages across the apparent centre of the solar disc is accompanied by geomagnetic disturbances. Acknowledgments are made to corresponding member AS USSR N.V.Smirnov for advice and consultations and to A.S.Dvoryashin for his assistance with data. There are 5 figures, 8 tables and 9 references: 7 Soviet and 2 non-Soviet.

ASSOCIATIONS: Astronomicheskiy sovet AN SSSR
(Astronomical Council AS USSR)
Matematicheskiy institut AN SSSR im. V.A.Steklova
(Mathematics Institute AS USSR imeni V.A.Steklov)

MUSTEL', E.R.

Corpuscular streams and the solar corona above active regions.
Astron.zhur. 38 no.3:385-401 My-Je '61. (MIRA 14:6)

1. Astronomicheskiy sovet AN SSSR.
(Sun)

S/035/62/000/007/024/083
A001/A101

AUTHORS: Mustel', E. R., Kopylov, I. M., Galkin, L. S., Kumaygorodskaya, R.N., Bartash, T. M.

TITLE: Spectrophotometric study of Nova Herculis 1960. I.

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 7, 1962, 31, abstract 7A236 ("Izv. Krymsk. astrofiz. observ.", 1961, v. 26, 181 - 216; English summary)

TEXT: About 120 spectrograms of Nova Herculis and ζAql taken as a standard were taken in March - April 1960 with the 122-cm reflector of the Crimean Astrophysical Observatory, mainly with a quartz spectrograph with dispersion of 155 A/mm at Hγ. The following quantities were determined: equivalent widths Wλ and values of $\Delta\lambda$(km/sec) for emission hydrogen lines Hβ-H$_9$, as well as central intensities I_o with respect to continuous spectrum for all identified emission lines in the spectrum of N Her. Changes of these characteristics of emission lines in the course of time were generally analyzed. The average speed of envelope expansion was estimated (1,850 km/sec) from the width of hydrogen lines.

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S/035/62/000/007/024/083
A001/A101

Spectrophotometric study of Nova Herculis 1960. I.

Approximate brightness and date of maximum luminosity of N Her were determined from spectral changes observed in this Nova: $m_{max} = 2^m.50 \pm 0^m.17$ (probable error); March $1 \pm 2^d.5$ (probable error). The absolute magnitude of the Nova in maximum was determined ($M_v = -10^m.0$), as well as distance to the star (R = 1,250 pc) and total interstellar absorption in visual light at star distance ($A_v = 2^m.0$). By comparing with ζ Aql relative energy distribution was obtained for each night in continuous spectrum of N Her within the wavelength range $\lambda\lambda$3,512 - 5,050. Balmer decrement was calculated from lines $H\beta$-H_9. There are 12 references.

From authors' summary

[Abstracter's note: Complete translation]

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33422

S/033/62/039/001/004/013
E032/E514

3.2430 (1482)

AUTHOR Mustel', E.R.

TITLE On the "cone of avoidance" hypothesis in the problem of the origin of corpuscular streams

PERIODICAL: Astronomicheskiy zhurnal, v. 39, no. 1, 1962, 41-47

TEXT: The author compares the cone of avoidance hypothesis (Ref. 1: C. W. Allen, Monthly Not. Roy. Astronom. Soc., 104, 13, 1944. Ref. 2: J. C. Pecker, A.O. Roberts, Journ. of Geophys. Res., 60, 35, 1955) and the active-region hypothesis advanced by the present author in previous papers (Ref. 3: Astron. zh., 38, 385, 1961; Ref. 4: Ibid, 28, 1961). According to the former hypothesis active regions themselves are not a source of corpuscular streams, each active region merely deflects to one side the general corpuscular emission of the sun giving rise to a relatively empty region which is usually referred to as the cone of avoidance. In the active-region hypothesis on the other hand the exceptionally stable R maximum on the curves obtained with the "superposed epoch" method is largely due to corpuscles from the active regions themselves, while the L maximum is due to the fact that the mean

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distance between neighbouring plages is approximately six days. The left maximum is therefore due to the "neighbouring" plages. In order to throw light on this difference between the two hypotheses, the plages used in the superposed epoch method were divided into groups, each of which contains only those original plages for which the neighbouring plages with larger longitude are separated from the original plages by distances ΔL_c = 3, 4, 5 6, 7, 8 days. For each of these groups the superposed epoch curve is replotted. According to the active-region hypothesis, only the right-hand maximum should retain its position in this analysis, while the left maximum should shift towards the left as ΔL_c increases, and there should be a linear relation between the position of this maximum and ΔL_c. Numerical calculations carried out for about 700 plages have shown that these predictions of the active-region hypothesis are in fact confirmed. The maximum does shift to the left and the relation between the position of the maximum and ΔL_c is linear. The conclusion is that the present results fully confirm the active-region hypothesis and are in conflict with the cone of avoidance hypothesis. In particular, for $\Delta L_c > 6$ days there is no maximum at the CMP line.

($\Delta t = 0$) although this would be expected on the cone of avoidance theory. Finally, the effect of variations in the geomagnetic field on the superposed epoch curves is discussed. It turns out that the left-hand part of the integral curve is composed of isolated and relatively high L maxima corresponding to different ΔL_c. However, owing to interference phenomena discussed in Ref. 4 the left-hand side of the integral curve, including the L maximum, is much lower than the R maximum. This is said to indicate once more that the only stable formation on the superposed epoch curves which has a definite physical significance is the right maximum. The main reason for the reduction in the field amplitude on the integral curve of the superposed epoch method is the mutual superposition of M-disturbances. There are 3 figures and 9 references: 5 Soviet-bloc and 4 non-Soviet-bloc. The English-language references read as follows. Refs.1 and 2 quoted in text; Ref.8: F.Ward and R. Shapiro, Journ. of Geoph.Res., 66, 739, 1961. Ref.7: G Newkirk, Astrophys.Journ., 133, 983, 1961.

ASSOCIATION: Astronomicheskiy sovet Akademii nauk SSSR
(Astronomical Council of the Academy of Sciences USSR)

SUBMITTED: September 10, 1961
Card 3/3

3,1900
3,2410

S/0[illegible]/039/002/001/014
E03[illegible]

AUTHOR: Mustel', E.R.

TITLE: Novae as a possible source of cosmic rays

PERIODICAL: Astronomicheskiy zhurnal, v.39, no.2, 1962, 185-197

TEXT: The author gives a critical discussion of the mechanisms which may be responsible for the replacement of the pre-maximum spectrum of a nova by the principal spectrum. This replacement is a universal result for all novae and suggests the presence of certain forces which accelerate gases ejected from the novae immediately after the light maximum. The review given in a previous paper (Izv. Krymsk. astrofiz. observ., v.4, 23, 1949) is critically reconsidered. The following acceleration mechanisms are discussed: a) shock wave; b) acceleration of the detached envelope by gas condensations and c) light pressure. In addition, a critical discussion is given of the hypothesis according to which the pre-maximum and principal spectra are due to the continuous outflow of gases whose intensity and velocity undergo a change near the light maximum. All existing spectroscopic and other observations are shown to indicate that

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Novae as a possible source ...

none of these mechanisms is satisfactory. It is concluded that cosmic-ray pressure is mainly responsible for the acceleration of the envelope. It is argued that the intermediate "cavity" which appears immediately after the light maximum between the envelope and the star is filled by cosmic rays. The quantitative consequences of this cosmic-ray hypothesis are worked out and a formula is derived giving the total cosmic-ray energy flux entering the inner parts of the separating envelope. This flux is $EN_R \sim 5 \times 10^{41}$ erg/sec (on the average, for a typical nova). The losses experienced by cosmic rays are discussed. It is estimated that the fraction of cosmic rays leaving the envelope for interplanetary space is approximately 0.1. The paper is concluded with a discussion of the interaction of cosmic rays with gases in the detached envelope in the presence of frozen-in magnetic fields. It is estimated that the mean energy of all cosmic rays produced during the nova explosions in the Galaxy is about 4×10^{40} erg/sec. There are 2 figures.

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S/033/62/039/002/001/014
E032/E414

Novae as a possible source ...

ASSOCIATION: Astronomicheskiy sovet Akademii nauk SSSR
(Astronomical Council, Academy of Sciences USSR)

SUBMITTED: October 1, 1961

Card 3/3

3,1540

S/033/62/039/003/002/010
E032/E114

AUTHOR: Mustel', E.R.

TITLE: On the spatial structure of the solar corona. Part I.

PERIODICAL: Astronomicheskiy zhurnal, v.39, no.3, 1962, 418-427

TEXT: This paper is concerned with general problems associated with the structure of the solar corona, with particular reference to corpuscular streams. In the first part the author argues that the presence of relatively intense middle-latitude regions with Π-rays (streamers) and also much less developed equatorial and polar regions of the so-called intermediate corona, reflects the large-scale characteristics of the sun (general magnetic field, surface distribution, rotational characteristics and so on). On this approach the role of active regions is of secondary importance and the average density of the corona in the equatorial belt (between active regions) is less than the average density in the belt of Π-rays. This is responsible for the lower brightness of the corona in the equatorial belt. One of the strongest arguments in favour of this hypothesis is that, contrary to the alternative cone-of-avoidance hypothesis, the

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On the spatial structure of the ...

solar corona is denser over active regions than over other ray structures. Next, a discussion is given of the main geometrical properties of Π-rays. Particular attention is paid to the size of these rays and it is argued that according to the available evidence the total length of these rays is of the order of 30-50 solar radii. Even if the rays do reach the earth's orbit they must be very weak, and in any case they cannot be the source of M-disturbances. It is argued further that there is little point in comparing coronal rays obtained from eclipse photographs with geomagnetic disturbances, or in deducing the corpuscular delay time from such comparisons. In the final part of this paper the author discusses a recent article by M. Waldmeir (Zeitschrift fuer Astrophysik, v.53, 1961, 198) who investigated an eruptive prominence and came to the conclusion that the motion of the latter occurred along a Π-ray and was determined by the "solar wind". He concluded that Π-rays are in fact stationary gas streams. It is suggested that the coincidence of the trajectory of the prominence with the general contour of the corresponding coronal Π-ray was fortuitous so that Waldmeir's conclusion

On the spatial structure of the ... S/033/62/039/003/002/010
E032/E114

cannot be accepted.

ASSOCIATION: Astronomicheskiy sovet AN SSSR
(Astronomical Council, AS USSR).

SUBMITTED: December 1, 1961.

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39537
S/033/62/039/004/003/008
E032/E514

3.1540

AUTHOR: Mustel', E.R.

TITLE: On the spatial structure of the solar corona. Part II

PERIODICAL: Astronomicheskiy zhurnal, v.39, no.4, 1962, 619-631

TEXT: This paper is a continuation of previous work (Astronom.zh., 39, 418, 1962). It is concerned with the following problems: the structure of coronal rays above active regions (AR-rays), comparison of P-rays, i.e. rays above quiet prominences-filaments, with AR-rays, and the comparison of optical eclipse observations with radio-astronomical and polarimetric observations of the corona. The gas densities in AR-rays are discussed again and it is shown that these rays are the densest coronal formations. This has been confirmed up to distances $\Delta R \approx 2R_\odot$. The form of the AR-rays is discussed. It is shown that within the range $\Delta R \lesssim 2R_\odot$ the eclipse observations of Ye. Ya. Bugoslavskaya (Tr. Gos. astron. in-ta im. P. K. Shternberga, 19, 1950) are in complete agreement with G. Newkirk's polarimetric data (Astrophys. J., 133, 983, 1961). The geometrical properties of AR-rays at large distances from the

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sun are discussed and it is shown that there is considerable evidence for the fact that these rays extend over very large distances, reaching the earth's orbit and are approximately radial. The origin of the departure of these rays from the strictly radial direction is discussed and it is noted that these departures are largest for the rising branch of the solar activity curve and smallest for the descending branch. It is also noted that there is now considerable published evidence for the fine structure of AR-rays at large distances from the sun. A comparison is made between the geometric and physical properties of P-rays and AR-rays. The results are given in a detailed table in which the properties of the two types of rays are compared and contrasted in detail. Inspection of this table shows that the two types of rays are fundamentally different. Fig.2 is a schematic drawing illustrating the contrasting properties of AR- and P-rays. The left-hand side of the drawing (which is not drawn to scale) corresponds to the average latitude of maximum frequency of occurrence of active regions, while the right-hand side corresponds to the average latitude of the maximum frequency of occurrence of quiet filaments, i.e. P-rays. The right-hand side shows the

effect of the rotation of the sun, the narrowing of P-rays at the ends and the relatively short length of these rays. The left-hand side shows that AR-rays consist of isolated "tubes" leaving the active regions ABC etc. The final section is concerned with coronal rays in the active region belt but not in the regions themselves. It is shown that these rays should be similar to AR-rays but should have a lower gas density so that they cannot give rise to appreciable geomagnetic disturbances. The data reported by H. S. Bridge et al. (Publ. of 1961 Kyoto Conference on cosmic rays and the earth storm) are briefly discussed in the light of these results. There are 2 figures and 1 table.

ASSOCIATION: Astronomicheskiy sovet Akademii nauk SSSR
(Astronomical Council, AS USSR)

SUBMITTED: December 15, 1961

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41489
S/033/62/039/005/002/011
E032/E314

1540

AUTHOR: ~~Mustel', E.R.~~

TITLE: Longitudinal distribution of active solar regions and the problem of corpuscular disturbances

PERIODICAL: Astronomicheskiy zhurnal, v.39, no.5, 1962, 813-832

TEXT: This is a continuation of previous work by this author et al (Astron. zh., v.36, 1959, 215; v.38, 1961, 28; v.38, 1961, 385; v.35, 1958, 194; v.36, 1959, 5; v.39, 1962, 41; v.39, 1962, 619; v.38, 1961, 227; Izv. Krymsk. astrofiz. observ., v.27, 1962, 167; Dokl. AN SSSR, v.42, 1944, 117). In the present paper, the influence of the longitudinal distribution of active regions (plages) on the characteristics of the SEM (superimposed epoch method) curves is investigated. The observational material includes plages which passed through the visible centre of the solar disc during CMP or very near to it. The data were obtained from an examination of several spectroheliograms covering the interval 1907 - 1952. The entire interval is divided into 12 periods and the results of the application of the SEM are shown in Figs. 1 and 2. It is apparent from these curves that

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Longitudinal distribution ...

their most stable characteristic is the main maximum R, which is always preceded by the minimum Min. Frequently, there are further maxima R' and L. The form of the SEM curves at $\Delta t = -12^d$ and $+15^d$ is roughly the same (effect of the 27-day recurrence). A detailed statistical analysis is made of these distributions, in which histograms are obtained giving the distribution of the number of equal distances between neighbouring plages as a function of these distances for each of the above 12 periods. It was found that all the histograms had clearly defined maxima. This analysis is followed by a general explanation of the presence of the R, R' and L maxima and of the minima Min on the SEM curves which is then used to analyse each of the curves separately. The main conclusion is, as before (the present author - Astron. zh., v.39, 1962, 41), that the only stable maximum on the SEM curves is the R maximum and that all the remaining characteristics of these curves are due to the longitudinal distribution of active regions. The final section of the paper is concerned with a critique of Saemundsson's paper (Monthly Notices Roy. Astron. Soc., v.123, 1962, 299) which is

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also concerned with general statistical aspects of the origin of M-disturbances. Saemundsson has reported some doubt as to the present author's conclusion that central plages are responsible for M-disturbances. It is now argued that Saemundsson's analysis suffers from the following shortcomings: 1) the analysis was based on inadequate observational material, 2) the model used was not directly related to the previous analyses of the present author (cf. references at the beginning of this abstract) and 3) Fig.13 of Saemundsson's paper is based on plages with very different latitudes and hence does not materially contribute to the problem at hand. For these and other reasons the author considers that Saemundsson's conclusions are incorrect. There are 15 figures and 2 tables.

ASSOCIATION: Astronomicheskiy sovet Akademii nauk SSSR
(Astronomical Council of the AS USSR)

SUBMITTED: December 15, 1961

MUSTEL', E.

"Mars-1" is in flight. Av. i kosm. 45 no.11:8-10 '62.
(MIRA 15:11)

1. Chlen-korrespondent AN SSSR.
(Space flight)

GURZADYAN, Grigor Aramovich; AMBARTSUMYAN, V.A., red.; MUSTEL', E.R., red.; SEVERNYY, A.B., red.; SOBOLEV, V.V., red.; KULIKOV, G.S., red.; BRUDNO, K.F., tekhn. red.

[Planetary nebulae] Planetarnye tumannosti. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1962. 384 p. (MIRA 15:9)
(Nebulae)

MUSTEL', E.R.

Analysis of the chemical composition of envelopes of novae.
Astron. zhur. 40 no.6:1007-1012 N-D '63. (MIRA 16:12)

1. Astronomicheskiy sovet AN SSSR.

KAPLAN, Samuil Aronovich; PIKEL'NER, Solomon Borisovich; AMBARTSUMYAN, V.A., red.; MUSTEL', E.R., red.; SEVERNYY, A.B., red.; SOBOLEV, V.V., red.; KULIKOV, G.S., red.; AKSEL'ROD, I.Sh., tekhn. red.

[Interstellar medium] Mezhzvezdnaia sreda. Moskva, Fizmatgiz, 1963. 531 p. (MIRA 17:2)

MUSTEL',E.R.; BOYARCHUK, A.A.; BARTASH, T.M.

Energy distribution in the continuum of N Aquilae 1918 and RS Ophiuchi. Izv. Krym. astrofiz. obser. 30:19-24 '63.
(MIRA 17:1)

L 18935-63 BDS GW S/0026/63/000/006/0017/0024

ACCESSION NR: AP3003326

AUTHOR: Mustel', E. R., Corresponding Member of the Academy of Sciences of the SSSR

TITLE: Solar corpuscles and the interplanetary medium

SOURCE: Priroda, no. 6, 1963, 17-24

TOPIC TAGS: "solar wind," comet tail, "frozen-in" magnetic field, geomagnetic storm, interplanetary space, corpuscle stream

ABSTRACT: The earth actually lies within the outer part of the solar corona. V. A. Kratt and associates at Pulkovo have shown that the chromosphere is a complex, unhomogeneous formation consisting of separate fibers and clusters with different temperatures. The gaseous component of the interplanetary medium is made up almost entirely of corpuscular radiation from the sun. Even when there are no active areas (sun spots), the sun is constantly emitting a stream of corpuscles. Hence the corona cannot be regarded like the earth's atmosphere as a sort of hydrostatic formation. The latest theoretical work and rocket research have shown that it is a dynamic, constantly expanding medium, in each point of which there are fields of corpuscles moving from the sun with different speeds, densities, etc. This has been called the "solar wind," though it differs radically from terrestrial winds in

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temperature, density, speed and many other characteristics. The latest research has shown that the sources of corona heat are so great that it cannot be in equilibrium. The article gives the speed and density data furnished by Soviet and American (Mariner II) rockets: 450 km/sec, 10 sup 8 cm sup -2 sec sup -1, average density about 2.5 particles per 1 cu cm. M. S. Bobrov in the Astro-Council of the AS USSR concluded that the intensity of the disturbances on the polar caps hardly depends at all on solar activity, i.e. the outflow of gases from the sun is stable. L. Birman has advanced the hypothesis that the gases emitted from the nucleus of a comet are driven away by the solar wind, light alone being insufficient to turn its tail away from the sun, as thought heretofore. But the density of the gases is too low for this: one must also take into account magnetic fields "frozen" into the corpuscular streams. In interplanetary space we have to do both with individual condensations moving almost strictly radially and with these corona rays assuming a curved form due to the sun's rotation. All rocket observations, Soviet and American indicate that areas completely free of a magnetic field are very rare in interplanetary space. It may measure from a few gammas on still days to 20 or more during geomagnetic disturbances. The geomagnetic storms recurring every 27 days (sun rotation time) are believed to be due to the periodic sweep of a stream of corpuscles from a fixed source somewhere on the sun. It may be considered that about 4-5 days after a calcium floccule (active area) passes through the visible center of the solar disc

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ACCESSION NR: AP3003326

the earth enters a stream of corpuscles and the disturbance begins. There is every reason to believe that the elasticity of these rays is due to the magnetic field "frozen into them." The author's preliminary calculations show that such elasticity requires fields of 1-10 gammas, precisely the order of magnitude of the fields measured in interplanetary space. The density of the corona over the active areas is about 10 times greater than over the rest of the sun's surface. In any case interplanetary space is not amorphous, but has a structure; indeed, its main features may be sketched in fair detail, with a system of curved elastic coronal rays playing one of the main roles. But much work remains to be done to convert this into a precise model. Orig. has 3 graphs, 4 diagrams and 1 photo.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 26Jul63 ENCL: 00

SUB CODE: AS NO REF SOV: 000 OTHER: 000

Card 3/3

MUSTEL', E.R.

Symposium on the Physics of Chromospheric Flares. Vest. AN SSSR 34 no.3:119-120 Mr '64. (MIRA 17:4)

1. Chlen-korrespondent AN SSSR.

BOYARCHUK, A.A.; MUSTEL', E.R.

Line spectrum of the "old" Nova Aquilae 1918 (V 603 Aql).
Astron. zhur. 41 no.3:587-589 My-Je '64. (MIRA 17:6)

1. Krymskaya astrofizicheskaya observatoriya AN SSSR i Astronomicheskiy sovet AN SSSR.

MUSTEL', E.R.

Solar corpuscular streams and geomagnetism. Astron.zhur. 41 no.5:777-800 S-O '64. (MIRA 17:10)

1. Astronomicheskiy sovet AN SSSR.

MUSTEL', E.R.; MOGILEVSKIY, E.I.

Solar activity and the geoelectric complex of phenomena. Geofiz. biul. no.14:92-95 '64. (MIRA 18:4)

MUSTEL', E.R.

Quasi-stationary corpuscular streams on the ascending [illegible] cycle of solar activity. Astr. zhur. 42 no. [illegible] 1965.

1. Astronomicheskiy sovet AN SSSR.

L 47310-66 EWT(1)/FCC GW

ACC NR: AR6028405 SOURCE CODE: UR/0269/66/000/005/0055/0055

AUTHOR: Mustel', E. R.; Bonelis, I. V.; Kubyshkin, V. V.

37
B

TITLE: The effect of cosmic rays on the lowest layer of the Earth's atmosphere

SOURCE: Ref. zh. Astronomiya, Abs. 5.51.429

REF SOURCE: Astron. tsirkulyar, no. 333, iyulya 10, 1965, 1-6

TOPIC TAGS: cosmic ray, atmospheric pressure, chromospheric flare, solar flare

ABSTRACT: According to Soviet and Western Europe weather bureaus, the earth's atmospheric pressure increases on the 6th day after an active area passes through the center of the solar disk (an average of 13,878 active areas during the 1907-1952 period). This fact correlates with an increase in geomagnetic activity. After chromospheric flares, the atmospheric pressure on the Sun increases sychronously with an increase of geomagnetic activity (on the 4th day after a flare). Thus, the effect of solar corpuscular streams causes an increase

Card 1/2 UDC: 523.75:523.165+525.24

L 47310-66
ACC NR: AR6028405

in atmospheric pressure. At the same time, a decrease in atmospheric pressure occurs in the area of geomagnetic polar caps immediately following flares. The authors have associated this phenomenon with the activity of subrelativistic proton streams. Orig. art. has: 9 reference items. G. Ivanov-Kholodnyy. [FM]

[Translation of abstract]

SUB CODE: 03/

Card 2/2 afs

MUSTEL', E.R.; BARANOVA, L.I.

Analysis of the chemical composition of nova envelopes. Part 1: Quantitative analysis of the atmosphere of N Her 1963, at maximum brightness. Astron. zhur. 42 no.1:47-58 Ja-F '65. (MIRA 18:2)

1. Astronomicheskiy [illegible] AN SSSR.

L 61644-65 EWT(l)/EWG(v)/EEC-4/EEC(t) Pz-5/Pq-4 GM
ACCESSION NR: AP5015576 UR/0033/65/042/003/0473/0487
523.745

AUTHOR: Mustel', E. R.

TITLE: The role of active regions in the formation of quasi-stationary corpuscular streams from the sun

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 3, 1965, 473-487

TOPIC TAGS: solar radiation, solar activity, radio wave absorption, cosmic ray, space probe

ABSTRACT: A comparative and critical analysis was made of two hypotheses: one holding that quasi-stationary corpuscular streams of solar corpuscles originate in the active region, the other--the "cone of avoidance" hypothesis--maintaining that active regions merely deflect corpuscles of the solar "wind" generated in neighboring undisturbed solar regions. The author considers the most recent data on cosmic rays from the sun and on solar plasma, particularly velocities and magnetic fields, and he concludes that the corpuscular streams originate in active regions of the sun. He examines the report of R. P. Basler and L. Owen (Scient. Rept. of Geophysical Institute of the University of Alaska, 1964)

Card 1/2

L 61644-65
ACCESSION NR: AP5015576

concerning radio wave absorption in auroral zones and concludes that these data also support the active-region hypothesis rather than the opposite, as maintained in the report. The author discusses the statistical aspect, the properties of a disturbed geomagnetic field, and the physical properties of corpuscular streams in reference to the "cone of avoidance" theory and concludes that all data examined by him, including space-probe data on cosmic rays, disprove the theory. The principal basis for the "cone of avoidance" theory has been the presence of a supplementary maximum on statistical curves of activity vs time and the fact that this second maximum has a phase difference near zero relative to the first principal maximum. It is shown that the minimum between these two maximums, rather than being the "cause" of the two maximums, is merely an "intermediate" low between two independent maximums. Orig. art. has: 3 figures.

ASSOCIATION: Astronomicheskiy Sovet Akademii nauk SSSR (Astronomical Council of the Academy of Sciences, SSSR)

SUBMITTED: 20Dec64 ENCL: 00 SUB CODE: AA, EC

NO REF SOV: 019 OTHER: 025

Card 2/2

L 10647-66 EWT(1)/EOC/EWA(h) GW

ACC NR: AP6002690 SOURCE CODE: UR/0033/65/042/006/ 1232/1249

41
B

AUTHOR: Mustel', E. R.; Kubyshkin, V. V.; Bonelis, I. V.

ORG: Astronomical Council, Academy of Sciences SSSR (Astronomicheskiy Soviet Akademii nauk SSSR); Volgograd Teachers' Institute (Volgogradskiy pedagogicheskiy institut)

TITLE: Corpuscular streams and cosmic rays and their effect on the earth's troposphere

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 6, 1965, 1232-1249

TOPIC TAGS: cosmic ray, meteorological phenomenon, proton stream, corpuscular stream, tropospheric process, chromospheric flare

ABSTRACT: Quasi-stationary corpuscular fluxes emanating from active regions during the period of 1951 to 1953 are analyzed. Chromospheric flares recorded at several Arctic stations at different geomagnetic latitudes are plotted diagramatically. Analysis of the results indicates that the corpuscular streams produce a pressure increase, while the subrelativistic proton streams from chromospheric flares produce pressure decreases at the polar caps. It is noted that the amplitude decrease of atmospheric disturbances with decreasing geomagnetic latitude can be a source of additional atmospheric circulation. This assumption is borne out by analysis of chromospheric flares of 1956—1960. A more detailed discussion of all

UDC: 523.745

Card 1/2

L 10647-66

ACC NR: AP6002690

these problems is to be undertaken in the near future. Orig. art. has: 13 figures and 3 tables. [JJ]

SUB CODE: 04/ SUBM DATE: 25Jun65/ ORIG REF: 015/ OTH REF: 007/ ATD PRESS: 4169

HW

Card 2/2

ACC NR: AR6028766 SOURCE CODE: UR/0269/66/000/006/0062/0062

AUTHOR: Mustel', E. R.; Yegorova, N. B.

TITLE: Comparison of geomagnetic excitations with phenomena on the sun

SOURCE: Ref. zh. Astronomiya, Abs. 6.51.479

REF SOURCE: Sb. Solnechn. aktivnost'. No. 2. M., Nauka, 1965, 5-52

TOPIC TAGS: solar phenomenon, solar activity, solar flare, geomagnetic measurement

TRANSLATION: Comparative studies of recurrent geomagnetic excitations and flocculi passing through the center of the solar disc, and of sporadic geomagnetic excitations with chromospheric flares performed previously (See *RZh. Astr.*, 1963, 11.51.385) during the period 1 July 1957-31 December 1958 were continued to 31 December 1960. Two tables with data on the chromospheric flares and the resulting sporadic geomagnetic excitations for the periods 1924-1957 and 1957-1960 are included. In addition, there are 27 charts for 1959-1960 comparing the time of the passage of flocculi in the immediate vicinity of the center of the disc through the central meridian with moments of bursts of type IV radio frequency radiation, and with the beginning of geomagnetic excitations. The charts show a separation of 14 recurrent geomagnetic excitations, and their corresponding stable active areas. The following conclusions were obtained from an analysis of the tables: 1) the flares causing geomagnetic excitations are homogeneously distri-

Card 1/2 UDC: 523.75:525.24

ACC NR: AR6028766

buted over the solar disc; consequently, they emit particles in all directions. However, the very strong sporadic geomagnetic excitations are caused by flares near the central meridian; 2) the mean time of motion of corpuscular streams toward the earth is 2^d; this time does not depend on the heliographic latitude of the flare. For more powerful flares, this time is somewhat shorter; 3) bursts of type IV radio frequency radiation accompanied 55% of the flares which caused geomagnetic excitations; and 4) the presence of a flare is not a sufficient condition for the occurrence of a geomagnetic excitation. 15 references. M. Gnevyshev.

SUB CODE: 03

Card 2/2

L 02339-67 EWT(1) GW

ACC NR: AR6029442 (N) SOURCE CODE: UR/0169/66/000/005/A047/A047

36
B

AUTHOR: Mustel', E. R.; Yegorova, N. B.

TITLE: A comparison of geomagnetic disturbances with solar phenomena

12 12

SOURCE: Ref. zh. Geofizika, Abs. 5A281

REF SOURCE: Sb. Solnechn. aktivnost'. No. 2. M., Nauka, 1965, 5-52

TOPIC TAGS: geomagnetic disturbance, solar phenomenon, chromospheric flare, flocculation, solar flare

ABSTRACT: A comparison (See. RZhG fiz, 1963, 3A244) made previously for the period from July 1, 1957 to December 31, 1958, was continued until December 31, 1960, between recurrent geomagnetic disturbances with floccula passing through the apparent center of the solar disk, and sporadic geomagnetic disturbances with chromospheric flares. Tables were given with data on chromospheric flares and the resulting sporadic geomagnetic disturbances during 1924—1957 and 1957—1960. Fourteen recurrent geomagnetic disturbances and their corresponding stable active regions were delineated on 27 maps for 1959—1960. These maps compared the time

Card 1/2 UDC: 550.385:523.7

L 02339-67

ACC NR: AR6029442

O

when the floccula passed through the center meridian at the moment when they are in an earthbound direction with the times of radio emission type-IV surges and the beginning of the geomagnetic disturbances. The following conclusions were reached: 1) Flares, causing geomagnetic disturbances, are uniformly distributed over the Solar disk, which implies that particles are thrown from it in all directions. However, the very severe sporadic geomagnetic disturbances are caused by flares, near the central meridian. 2) The average time of the path of corpuscular currents is two days and does not depend on the heliographic lattitude of the flare. This time is much shorter for more powerful flares, if another disturbance preceded the given geomagnetic disturbance. 3) 55% of the flares which caused geomagnetic disturbances were accompanied by IV-type radio emission flares. 4) The presence of a flare is not the only condition necessary for causing a geomagnetic disturbance. Orig. art. has: 15 reference items. M. Gnevysheva. [Translation of abstract].

SUB CODE: 03/

Card 2/2

ACC NR: AP6032684 SOURCE CODE: UR/0203/66/006/005/0815/0821

AUTHOR: Mustel', E. R.; Maysuradze, P. A.

ORG: Astronomic Council, AN SSSR (Astronomicheskiy sovet AN SSSR); Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves, AN SSSR (Institut Zemnogo magnetizma, ionosfery i resprostraneniya radiovoln AN SSSR)

TITLE: Radial dimensions of corpuscular stream from a chromospheric flare and the time during which the earth was located in the stream

SOURCE: Geomagnetizm i aeronomiya, v. 6, no. 5, 1966, 815-821

TOPIC TAGS: chromospheric flare, magnetic perturbation, corpuscular stream, sudden magnetic storm, radiation belt, magnetosphere, horizontal component, SOLAR FLARE, SOLAR CHROMOSPHERE, SOLAR CORPUSCULAR RADIATION

ABSTRACT: Intense chromospheric flares last less than 2 hr, but sporadic magnetic perturbations last about 1—1.5 days. This difference in duration indicates that the corpuscular stream caused by a flare is heterogeneous and gases ejected from the sun move at different speeds. An attempt is made to determine the stream thickness. A shell including the stream cloud is determined by the outer and inner radii. The difference between the outer and inner radii yields the dimensions of the

 UDC: 550.385

ACC NR: AP6032684

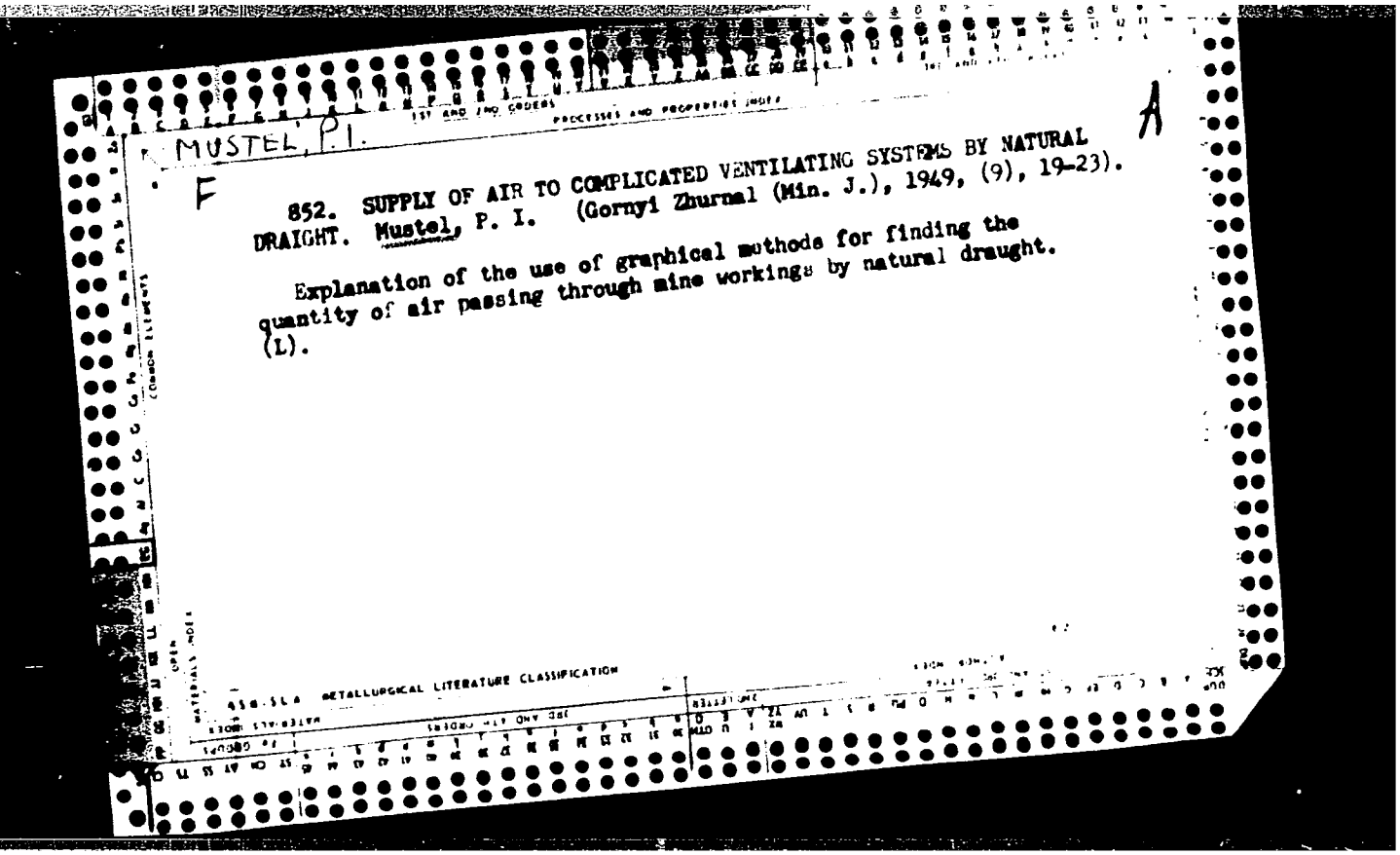
cloud. The beginning of the sudden magnetic storm indicates the arrival of the first particles ejected from the flare which influences the radiation belts of the earth and the magnetosphere. This moment can be detected by the appearance of the D_{st} variations in the horizontal component of the magnetic field. D_{st} variations appear distinctly in recording instruments of magnetic stations of low latitudes and have a global character. When the D_{st} variations disappear and the normal magnetic field is restored, it also means that slow particles have passed the earth's orbit. The thickness of the particle cloud can be determined from the beginning and the end of the magnetic storm and the velocity of the particle stream. Moments of the beginning and the end of the storm can be determined, taking into consideration magnetic indices K, a_p, and a_c. K characterizes the general perturbed field, a_p specifies irregular changes of the magnetic field associated with D_{st} variations at low latitudes, and a_c the same kind of changes in polar regions. These indices characterize the commencement and end of the storm. Orig. art. has: 1 table, 2 figures, and 6 formulas.

SUB CODE: 03/ SUBM DATE: 17Jul65/ ORIG REF: 003/ OTH REF: 003

Card 2/2

MUSTEL', P.I., dotsent

Heat effect of air temperature in mines. Gor. zhur. 122 no.2: 36-37 F '48. (MLRA 8:9)
(Mine sanitation)



MUSTEL, P.I.

F

852. SUPPLY OF AIR TO COMPLICATED VENTILATING SYSTEMS BY NATURAL DRAIGHT. Mustel, P. I. (Gornyi Zhurnal (Min. J.), 1949, (9), 19-23).

Explanation of the use of graphical methods for finding the quantity of air passing through mine workings by natural draught. (L).

A

MUSTEL, V.I.

F

A

Mustel

W76. METHOD OF SAMPLING FOR DETERMINING DUST CONCENTRATION IN AIR of mines. Mustel, V.I. (Moscow). (Min. J.), No 1951, (Eng). In making calculations concerning reduction of dust formation in mines, it would be useful to have data on the quantities of harmful dust (i.e., particles less than 10 microns) produced in specific operations, e.g., per metre of hole drilled, per ton of ore blasted, or per ton loaded. Measuring and sampling methods to be used to this end are discussed. (L).

1. MUSTEL', P. I.; YERMAKOV, V. K.; MINAS'YAN, B. P. ENG. (Reviewers)
2. USSR (600)
4. Mine Ventilation
7. "Mine Ventilation." A. Kh, Dmaokhov (author), Gor. zhur. no. 11, 1952.

9. Monthly List of Russian Accessions, Library of Congress, January, 1953. Unclassified.

MASTEL, P. I.

Sampling Method for the Determination of the Dust Content of the Air in Mines. Minno Delo (Mining), #3:67:Mar 55

Name: MUSTEL' Pavel Ivanovich

Dissertation: Experimental Study, Theory, and Calculation of the Ventilating Resistance of Circular Mining Shafts

Degree: Doc Tech Sci

Affiliation: [not indicated]

Defense Date, Place: 25 Jun 54, Council of Leningrad Order of Lenin and Order of Labor Red Banner Mining Inst

Certification Date: 15 Sep 56

Source: BMVO 6/57

Mustel P.I.

IGNATENKO, Konstantin Pavlovich, gorn.inzh.; BRAYTSEV, Andrey Vasil'yevich, kand.tekhn.nauk; VEYTS, Yelizaveta Grigor'yevna, gorn.inzh.; MUSTEL', P.I., otvetstvennyy red.; GRISHAYENKO, M.I., red.izd-va; ALADOVA, Ye.I., tekhn.red.

[Mine ventilation, illumination, fires, and rescue work] Rudnichnaia ventiliatsiia, osveshchenie, rudnichnye pozhary i gornospasatel'noe delo. Moskva, Ugletekhizdat, 1957. 247 p. (MIRA 11:3)
(Mine rescue work) (Mine fires)
(Mine ventilation) (Mine lighting)

MUSTEL', P.I.

Determination of the coefficient of ventilation resistance of round mine shafts. Zap. LGI 38 no.1:8-25 1959 (MIRA 14:3)
(Mine ventilation)

MUSTEL', P.I.

Determining the coefficients of reserve air in coal mines.
Zap. LGI 38 no.1:26-38 1959 (MIRA 14:3)
(Mine ventilation)

MUSTEL', P.I.

Effectiveness of measures for reducing air leaks in mines.
Zap. LGI 46 no.1:12-21 '62. (MIRA 16:6)

(Mine ventilation)

MUSTEL', Pavel Ivanovich; DYATLOV, V.I., inzh., retsenzent; YERMAKOV, P.I., inzh., retsenzent; ZAYTSEV, A.P., otv. red.

[Principles of safety engineering and fire fighting technology in prospecting] Osnovy tekhniki bezopasnosti i protivopozharnoi tekhniki pri geologorazvedochnykh rabotakh. Moskva, Nedra, 1964. 183 p. (MIRA 17:11)

BENDRIKOV, G.A.; KRASNUSHKIN, P.Ye.; REYKHRUDEL', E.M.; POTEMKIN, V.V.; MUSTEL', Ye.R.; RZHEVKIN, K.S.; IVANOV, I.V.; KHARLAMOV, A.A.; TIKHONOV, Yu.V.; STRELKOVA, L.P.; KAPTSOV, L.N.; ORDANOVICH, A.Ye.; KHOKHLOV, R.V.; VORONIN, E.S.; BERESTOVSKIY, G.N.; KRASNOPEVTSEV, Yu.V.; MINAKOVA, I.I.; YASTREBTSEVA, T.N.; SEMENOV, A.A.; VINOGRADOVA, M.B.; KARPEYEV, G.A.; DRACHEV, L.A.; TROFIMOVA, N.B.; SIZOV, V.P.; RZHEVKIN, S.N.; VELIZHANINA, K.A.; NESTEROV, V.S.; SPIVAK, G.V., red.; NOSYREVA, I.A., red.; GEORGIYEVA, G.I., tekhn. red.

[Special practical manual in physics] Spetsial'nyi fizicheskii praktikum. Moskva, Izd-vo Mosk.univ. Vol.1. [Radiophysics and electronics] Radiofizika i elektronika. 1960. 600 p.
(MIRA 13:7)

1. Professorsko-prepodavatel'skiy sostav otdeleniya radiofiziki fizicheskogo fakul'teta Moskovskogo gosudarstvennogo universiteta (for all, except Spivak, Nosyreva, Georgiyeva).
(Radioactivity) (Electronics)

9.2560
9.2580 (1163)

24875
S/109/61/006/007/015/020
D262/D306

AUTHORS: Braginskiy, V.B., Dianova, V.A., and Mustel', Ye.R.

TITLE: Investigation of the operation of a frequency multiplier using the non-linear capacity of the p-n--junction

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 7, 1961, 1173 - 1177

TEXT: The above problem was investigated for large coefficients of multiplication (up to n = 50). Main scheme of the multiplier is given in Fig. 2. The multiplier consists of a 70 ohm coaxial line and a standard coaxial - waveguide passage. In the gap is situated diode 1, with its non-linear capacity. An alternating potential from a generator (frequency range: 184 - 600 Mc/s) is connected to the input of the multiplier through a constant attenuator (10-12 db). Maximum power from the generator: 3.5 W. Coaxial piston [illegible] and the non-linear element form the input contour. Piston [illegible] is isola-

Card 1/5

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D262/D306

Investigation of the ...

ted from the outside tube of the coaxial. The output contour is formed by coaxial piston 3 and two quarterwave beakers 4. Through a diaphragm it is connected with a rectangular resonator which filters out the harmonics of a corresponding n-number. The Q-factor of the resonator is 200, which reduces the neighboring harmonics with 20 db in comparison. Without filtering, these harmonics are 5 times smaller, than the chosen harmonics. The output signal is fed into a spectroanalyzer, specially calibrated for power, or into a standard power meter. The output power of the multiplier is shown graphically as a function of the number of harmonics. Input signal changed from 184 to 600 Mc/s, output signal (9000 Mc/s) and input power remained constant. The ordinate represents the ratio of the output power of n-th harmonics to that of the 49th harmonics. -At input power P_{in} = 100-150 mW, the output power saturates, there for smaller coefficients of multiplication. For the investigation of phase stability 2 identical multipliers were used, with two valves and measuring line of the same direction. The signal came from a common generator. After 1½ hours of warming up, the device

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Investigation of the ...

was working for 9 hours without break. The amplitude changed by 10 %. Change in phase difference was less than 60°. To investigate the possibilities of modulation, an additional 10 Mc/s alternating signal was fed in. The spectro-analyzer showed a split of the line into components, standing at 10 Mc/s from each other. With large modulation it is possible to redistribute the energy between the central line and the side components. The greatest observed output power: 2.5 mW (n = 96, $\tau = (R_g C)_{opt} = 0.96 \cdot 10^{-12}$ sec) the input power being of the order of 250 mW. This means that the transformation loss was not more than 20 db, which is 11 db better than the minimum loss observed, when an active non-linear element is used with an ideal filtering system on the same frequencies. The coefficient of power transformation and the magnitude of output power are slightly higher than those for a two-[illegible] multiplier. This type of multiplier can be used in measurements and also as a high-stability heterodyne. To achieve power of the order 1 mW, the time constant of p-n junction of the diode should be better than $1 \cdot 10^{-12}$ sec. There are 6 figures and " non-Soviet-bloc refer-

Card 3/5

ces. The references to the 4 most recent English-language publications read as follows: C.H. Page, Harmonic generation with ideal rectifiers, Proc. I.R.E., 1958, 46, 10, 1738; D. Leenov, A. Uhlir, Jr., Generation of harmonics and subharmonics at microwave frequencies with p-n junction diodes, Proc. I.R.E., 1959, 10, 1734, D.B. Leeson, S. Weinreb, Frequency multiplication with non-linear capacitors - A circuit analysis. Proc. I.R.E., 1959, 12, 2076; R. Lowell, M. Kiss, Solid-state microwave power sources using harmonic generation, Proc. I.R.E., 1960, 7, 1834.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova, kafedra teorii kolebaniy (Faculty of Physics, Moscow State University im. M.V. Lomonosov, Department of Theory of Oscillations)

SUBMITTED: November 17, 1960

Card 4/5

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135730005-6"

24875

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D262/D306

Investigation of the ...

Fig. 2. Main scheme of the construction of the multiplier.

Legend: 1 - Non-linear capacity; 2, 3 - coaxial pistons; 4 - quarter wave beakers; 5 - resonator filter.

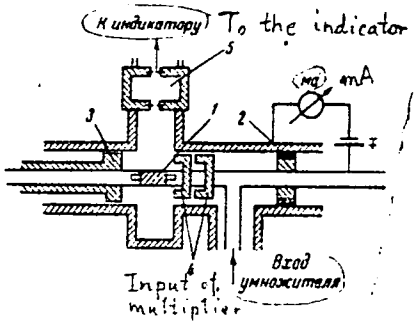

Рис. 2. Принципиальная схема конструкции умножителя:

1 — нелинейная емкость; 2, 3 — коаксиальные поршни; 4 — четвертьволновые стаканы; 5 — резонатор-фильтр

Card 5/5

S/109/62/007/002/020/024
D256/D303

9,4 000

AUTHORS: Dianova, V.A., Maneshin N K., Muslel, Ye R., and Parygin, V.N

TITLE: UHF-multiplier with a high multiplication factor

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 2, 1962, 348 - 349

TEXT: Preliminary results are reported on investigating a frequency multiplier with a p-n diode used as a non-linear capacity. The construction of the multiplier was essentially identical to that described previously by V.B. Braginskiy, et al. (Ref. 4: Radiotekhnika i elektronika, v. 6, no. 7, 1961, 1173), but the output frequency was increased to 24,000 Mcs/sec. The dependence of the output power upon the number of the harmonic is presented in the form of a graph showing that between the 32nd and 85th harmonics the power decreases smoothly by 14 db. The maximum signal observed was 70 db above the noise level. The time constant of the diode measured at -10 V was 1.14×10^{-13} sec. At 660 Mcs/sec input frequency the multiplier

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UHF-multiplier with a high

S/109/62/007/002/020/024
D256/D303

was found to be adequate for heterodyne purposes, and it was used successfully for recording signals from a molecular generator. There are 2 figures and 1 Soviet-bloc reference.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova (Faculty of Physics, Moscow State University im. M.V. Lomonosov)

SUBMITTED: June 15, 1961

Card 2/2

S/109/62/007/004/[illegible]/[illegible]
D271/D302

9,1310

AUTHORS: Mustel', Ye.R., and Solov'yev, G.N.

TITLE: The use of coupled resonant cavities in degenerate mode as microwave band-pass filters

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 4, 1962, 710 - 713

TEXT: Results are reported of an experimental study of a new type of band-pass filter for the 3 cm band, with a maximum pass-band of 76 mc/s. The disturbance of the cavity in which degeneration takes place couples oscillations of various modes which have identical or very close frequencies, i.e. the degeneration is removed. When two cavities with n-fold degeneration are coupled, the system becomes analogous to 2n coupled circuits. The filter which was studied is shown in Fig. 2; n was made 2 or 3. Attenuation measurements, by substitution, were performed with various coupling diaphragms; cavities were disturbed by screws and their penetration was adjusted so as to obtain minimum ripple within the widest possible band. The coupling between two different modes, with identical or near-identi-

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cal frequencies, is expressed by inter-mode coupling coefficients

$$\gamma_{ij} = \int_{\Delta V} (\vec{E}_i\vec{E}_j - \vec{H}_i\vec{H}_j)dV, \quad \Delta V \sim V. \qquad (1)$$

In a filter with double degeneration, optimal position of screws is at $\varphi = 45^0$ or 135^0. The loaded Q-factor of cavities with double degeneration was 600, with triple degeneration - 500. Removing the degeneration improved very considerably both the band-width and the flank-steepness of the system. Triple degeneration occurs for a definite relation of cavity dimensions, e.g. when $l/a = 2.02$, H^1_{111}, H^2_{111} and E_{C01} have all the same frequency; two screws are required to couple all three modes. Dimensional data, results of measurements and frequency characteristics are given for double- and triple-degenerated filters with various diaphragms and screw penetrations. The system, with better Q-factor of cavities, can be used in frequency detectors. There are 5 figures, 2 tables and 6 references: 2 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: A.G. Little, Proc. IRE, v. 49, no. 4, 1961, 821; G. Shaffner, and F. Voorhaar, Proc. IRE, v.

Card 2/3

L 11274-63 EWS

ACCESSION NR: AP3003716 S/0109/63/008/007/1156/1164

46

AUTHOR: Mantel', Ye. R.; Pary*gin, V. N.; Solomatin, V. S.

TITLE: Two-circuit parametric frequency dividers

SOURCE: Radiotekhnika i elektronika, v. 8, no. 7, 1963, 1156-1164

TOPIC TAGS: parametric frequency divider, series-connected divider, parallel-connected divider, pumping frequency generator, frequency division band, oscillation amplitude, pumping current, diode bias

ABSTRACT: A two-circuit parametric frequency divider with a series- or parallel-connected pumping frequency generator is studied. The study includes a theoretical summary of the operation of the device and an analysis and comparison of the operations of both types of circuits for the case when division factor n = 4. A parametric frequency divider with a D7 diode and a pumping frequency of 8—10 Mc was investigated. For the circuit with the series-connected pumping frequency generator, small relative frequency division bands were achieved. At n = 4 the relative band, $\Delta f/f = 1\%$. With an increase in the division factor, the band decreased, and at n = 8 division no longer took place. In the case of the parallel-connected pumping frequency generator

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L 11274-63

ACCESSION NR: AP3005716

division by a factor of 3—30 was observed. The dependence of oscillation amplitude in the division band and in the low-frequency circuit on detuning at a constant pumping current was plotted. At small pumping currents, oscillation amplitude changed with detuning, but with an increase in pumping current these changes become insignificant. The graph representing the dependence of division bandwidth on pumping current at a constant diode bias showed an increase in bandwidth with an increase in pumping frequency. At large pumping currents, the bandwidth begins to decrease. This phenomenon is probably caused by the occurrence of conductivity current in the diode. Orig. art. has: 6 figures, 10 formulas, and 1 table.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosov. Kafedra teorii kolebaniy (Physics Faculty, Moscow State University. Department of Oscillation Theory)

SUBMITTED: 20Jun62 DATE ACQ: 02Aug63 ENCL: 00

SUB CODE: SD NO REF SOV: 005 OTHER: 000

Card 2/2

L 19058-65 EWT(1)/EWA(h) Peb AFETR/ESD(c)/ESD(dp)

ACCESSION NR: AP4040918 S/0109/64/009/006/1079/1081

AUTHOR: Dianova, V. A.; Maneshin, N. K.; Mustel', Ye. R.; Pary*gin, V. N.

TITLE: Frequency multiplier with a nonlinear capacitance and high-Q circuits

SOURCE: Radiotekhnika i elektronika, v. 9, no. 6, 1964, 1079-1081

TOPIC TAGS: frequency multiplier, nonlinear capacitance frequency multiplier, 120 mc frequency multiplier

ABSTRACT: A new design (see Enclosure 1) of frequency multiplier is reported. The input resonator with an internal helical conductor is tuned to 120 mc; its cold Q-factor is about 600. The output toroid resonator is tuned to an n-th harmonic of the input signal; its cold Q-factor is about 700-900. The nonlinear element is represented by a p-n diode which acts as a coupling between the two resonators. For maximum output, the distance x is selected between $\lambda_{out}/4$ and $\lambda_{out}/2$. Outputs of 10 and 5 mw were obtained experimentally with multiplication factors

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L 19058-65
ACCESSION NR: AP4040918

18 and 24, respectively; the input power was 250-300 mw. Another multiplier was tested which had a multiplication factor of 2 and was intended as one stage of a multistage converter. It was found that: (1) the single-stage converter with a nonlinear capacitance has a conversion factor higher by 10 db than the multiplier with a nonlinear resistance; (2) the single-stage multiplier has a higher conversion factor than the multistage multiplier. Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 09May63 ENCL: 01

SUB CODE: EC NO REF SOV: 003 OTHER: 003

Card 2/3

L 19058-65

ACCESSION NR: AP4040918

ENCLOSURE: 01

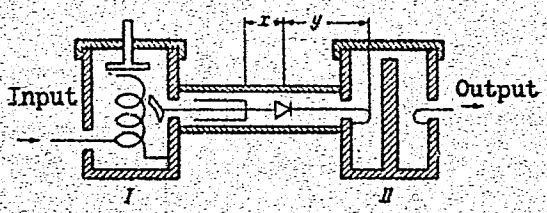

Fig. 1- Single-stage nonlinear-capacitance frequency multiplier

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L 42963-65 EEO-2/EWT(d)/EWT(l)/EPF(c)/EEC-4/EEC(t)/EEC(b)-2/EED-2 Pm-4/Pi-4/
Pac-4 LJP(c) GG/WW

ACCESSION NR: AP5010115 UR/0109/65/010/004/0770/0772

AUTHOR: Dianova, V. A.; Mustel', Ye. R.; Parygin, V. N. 41 48 B

TITLE: Modulation of light by means of toroidal resonators with ADP crystals

SOURCE: Radiotekhnika i elektronika, v. 10, no. 4, 1965, 770-772

TOPIC TAGS: nonlinear optics, ADP crystal, light modulation, pulsed modulation, toroidal modulator

ABSTRACT: Modulation of light by ADP crystals is discussed. A modulator of the type shown in Fig. 1 of the Enclosure was used in the study. The ADP crystal was placed in a toroidal resonator with its optical axis in the direction of the electric field. The light was propagated in the same direction. If the light is polarized along one of the main crystal planes, the light behind the resonator is elliptically polarized. In the experiments, light was pulse-modulated (pulse width, 3 μsec; repetition rate, 800 cps; pulse power, ~ 400 w) at frequencies of 204 Mc and 700 Mc. In the first case an ADP crystal (C_{cr} ~ 12 pf) 40 mm in diameter and 12 mm thick was used. The loaded Q of the resonator was ~ 500. The percentage modulation was ~ 18%, which corresponds to a phase shift of ~ 50%. A mirror placed on the output side of the modulator causes the beam to pass twice through the crystal. This doubles the phase shift and increases the percentage modulation to ~ 45%.

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ACCESSION NR: AP5010115

In the second case (700 Mc), the capacitance of the crystal was reduced to 0.5 pf as a result of which the percentage modulation (at a pulsed power of ~ 27 w) was ~ 13%. In both cases the length of crystal was $<< \ell_{max}$. A further decrease of C_{cr} to 0.2 pf resulted in modulation with a duty factor equal to two. The percentage modulation was 33% at a 1.2-w modulating signal and 10% at an input power of 100 mw. The percentage modulation was determined by means of an FEU-17A photomultiplier (maximum response at 3900 ± 300 Å) and an oscillograph. Orig. art. has: 3 formulas and 3 figures. [YK]

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova, Kafedra teorii kolebaniy (Physics Department, Moscow State University, Chair of the Theory of Oscillations)

SUBMITTED: 21Dec63 ENCL: 01 SUB CODE: SS,OP

NO REF SOV: 000 OTHER: 003 ATD PRESS: 3236

Card 2/3

L 52259-65 EEC-4/EWG(v)/EWA(h)/EWT(l)/EEC(t)/FCC Pe-5/Pi-4/Po-4/Pq-4/Pae-2/Peb
GW

ACCESSION NR: AP5010428 UR/0033/65/042/002/0276/0280

41
34
6

AUTHOR: Mustel', E. R.

TITLE: Quasi-stationary corpuscular streams during the descending phase of the 19th cycle of solar activity

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 2, 1965, 276-280

TOPIC TAGS: solar corpuscular stream, recurrent active region, central meridian, geomagnetic field, geomagnetic disturbance, magnetic tail, solar plasma

ABSTRACT: The fundamental source of solar corpuscular streams is the recurrent active M regions on the sun. A series of 14 passes of active solar regions through the central meridian are studied. These passes are compared with the state of the geomagnetic field. The stream emission from the sun is in a radial direction. The lag of geomagnetic disturbances behind the active region in the central meridian averages 5 days. The last phase of the observed active region is characterized by a local magnetic field and an absence of corpuscular emission. This state of the active region is termed the "magnetic tail" of the region. The minima and maxima of magnetic delay are represented graphically. The passes of active regions through the central meridian without geomagnetic disturbances are considered to be magnetic

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L 52259-65

ACCESSION NR: AP5010428 2

tails. The delay of magnetic disturbances after the passage of recurrent active regions through the central meridian corresponds to a corpuscular velocity of about 370 km/sec. The velocity of solar plasma measured by "Mariner 2" reached 650 km/sec. The difference between the computed and the measured velocities is explained by a gradual increase in the velocity of the emitted stream. Orig. art. has: 2 figures. [EG]

ASSOCIATION: Astronomicheskiy sovet Akademii nauk SSSR (Astronomical Council, Academy of Sciences SSSR)

SUBMITTED: 22Dec64 ENCL: 00 SUB CODE: AA

NO REF SOV: 005 OTHER: 008 ATD PRESS: 4010

Card 2/2

L 26118-66 EWT(d)
ACC NR: AP6014255 SOURCE CODE: UR/0109/66/011/005/0947/0949

AUTHOR: Dianova, V. A.; Mustel', Ye. R.; Parygin, V. N. 29 C

ORG: Physics Department, Oscillation Physics Section, Moscow State University im. M. V. Lomonosov (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta. Kafedra fiziki kolebaniy)

TITLE: Light modulation by 3.2 cm wave 45

SOURCE: Radiotekhnika i elektronika, v. 11, no. 5, 1966, 947-949

TOPIC TAGS: modulated light, optic modulator

ABSTRACT: An experimental investigation of light modulation was made at a frequency of 9260 Mc using the linear electro-optic effect in a single ADP crystal. A cylindrical resonator, in which E_{010}-type oscillations were excited, was used to produce the required longitudinal electric field. To reduce losses due to uhf and to increase the modulation efficiency, the resonator was partially filled with an electro-optical medium. A crystal, 3 mm in diameter and 10 mm long, was used for this resonator. Light modulation was accomplished in a pulsed regime with a large duty factor. With a 145-w modulating power a phase shift of 0.46 was obtained, which in turn corresponded to a modulation depth of 44%; with a modulating power of 9 w the modulation depth was 12%. The quality of the modulator for such a system was $1.4 \cdot 10^{-3}$ rad^2/w.

UDC: 535.241.13

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L 26148-66

ACC NR: AP6014255

A modulator consisting of two identical resonators with ADP crystals was also investigated. Both resonators were excited by the same generator. An increase of 1.75 in the phase shift at crystal output was obtained for the case of an optimum phase. A shift in the uhf field phase by π from the optimum phase at wavelength $\lambda = 3.2$ cm reduced the modulation depth to zero. This confirmed the fact that light modulation actually occurred at $\lambda = 3.2$ cm. Orig. art. has: 3 figures. [JR]

SUB CODE: 09/ SUBM DATE: 11Jun65/ ORIG REF: 001/ OTH REF: 004/ ATD PRESS: 4251

Card 2/2

ACC NR: AP6036381 (N) SOURCE CODE: UR/0109/66/011/011/2082/2085

AUTHOR: Dianova, V. A.; Mustel', Ye. R.; Fishuk, A. P.

ORG: Moscow State University im. M. V. Lomonosov Moskovskogo gosudarstvennogo universiteta) Department of Physics, (Fizicheskiy fakul'tet

TITLE: Frequency conversion using double modulation of light

SOURCE: Radiotekhnika i elektronika, v. 11, no. 11, 1966, 2082-2085

TOPIC TAGS: light modulation, frequency conversion

ABSTRACT: D. J. Blattner and F. Sterzer proposed a system for optical-band frequency conversion which permits using low-frequency photo detectors for reception of SHF-signal-modulated light. The system comprises an electro-optical crystal (frequency converter), an analyzer, and a photo detector. A light modulated at frequency ω_1 falls on a crystal placed in a field of frequency ω_2;

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ACC NR: AP6036381

the resulting light after the analyzer comes modulated by combination frequencies $m\omega_1 \pm n\omega_2$, where m and n are equal to 0, 1, 2, 3, ... A lowest $\omega_1 - \omega_2$ frequency is of practical importance. A further analysis of the above system points up the expediency of a polarization modulation (instead of AM); the polarization modulation system is simpler (the analyzer and two $\lambda/4$-plates not needed) and promises a double efficiency of conversion; the same electro-optical crystal can be used for modulation and conversion of frequency. In an experimental verification, a resonator was excited at 700 and 701 Mc, and an output signal of 1 Mc was received at the output of a photomultiplier. "The authors wish to thank V. N. Parygin for discussing the results." Orig. art. has: 2 figures and 9 formulas. * RCA Rev., 1962, 23, 3, 407.

SUB CODE: 20, 09 / SUBM DATE: 23Feb66 / ORIG REF: 003

Card 2/2

DIANOVA, V.A.; MANESHIN, N.K.; MUSTEL', Ye.R.; PARYGIN, V.N.

Frequency multiplier with nonlinear capacitance and high Q circuits. Radiotekh. i elektron. 9 no.6:1079-1081 Je '64. (MIRA 17:7)

CALIKOWSKI, Roman; MUSTER, Henryk

Preliminary studies on the boring susceptibility of rocks. Przegl geol 9 no.8:424-425 Ag '61.

1. Politechnika Warszawska.

MEISTER, Henryk, prof.

From the chronicles of astronautical congresses. Nowa Wies 17 no. 9:12-13 S '64.

1. Chairman, Warsaw branch of the Polish Astronautical Society, Warsaw.

Y/001/62/000/011/001/002
D267/D307

AUTHOR: Muster, Jože, Engineer

TITLE: Experimental production of pure synthetic minerals in a solar furnace and their characteristic features

PERIODICAL: Tehnika, no. 11, 1962, 2091-2096

TEXT: The experimental solar furnace, erected by the (Slovenian) Metallurgical Institute of Ljubljana at Piran in 1960, is described in detail. Local conditions permit temperatures of about 2500°C to be attained during 150 sunny days every year, and up to 2800 - 2900°C on some days in May - July. The heliostat has an automatic motion controlled by photo-transistors and a hydraulic driving mechanism. Usual porcelain crucibles can be used since the mixture is fused only in the center of the top layer. The minerals were obtained from two or three of the following oxides: CaO, MgO, Al_2O_3, SiO_2. About 0.5% of carbon black was added to the oxide mixture in order to facilitate the fusion. The following minerals were synthesized: dolomite, corundum, spinel, anorthite, cordierite,

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Experimental production ...

wollastonite, grossularite, helenite, akermanite, forsterite, monticellite, shannonite, merwinite, mullite, clinoenstatite and diopside.. The quality of ten of these 16 minerals was excellent. The identification was carried out by the Debye-Scherrer method and by means of X-ray diffractograms (Philips diffractometer PW 1051). There are 10 figures and 1 table.

ASSOCIATION: Metalurški institut u Ljubljani (Metallurgical Institute of Ljubljana)

SUBMITTED: March 26, 1962

MUSTER, Joze, inz., visi strucni saradnik (Ljubljana, Lepi pot 11)

Action of lime on the fire-resistant clay bricks for lime kilns. Tehnika Jug 18 no.6:Suppl.:Rudarstvo metalurg 14 no.6:1053-1056 Je '63.

1. Metalurski institut, Ljubljana (For Muster). 2. Institut za vatrostalne materjale, Kraljevo (for Stojanovic).

BACANU, Gh., dr.; SAVIN, Maria, chim.; MUSTETIU, Hortensia, chim.; MEMET, Aise, extern.

Criteria of hypoglycemic sulfonamide treatment in diabetes mellitus. Med. intern. 15 no.8:957-962 Ag '63.

1. Lucrare efectuata la Spitalul de adulti nr. 1, Timisoara (Sectia nutritie-dietetica si Centrul antidiabetic).
(DIABETES MELLITUS) (ANTIDIABETICS)

CATEGORY : Farm Animals. Swine

ABS. JOUR. : RZBiol., No. 13, 1958, No. 59580

AUTHOR : Mustaykayte, I. ..
INST. : Leningrad Veterinary Institute
TITLE : Sacral Nerves of the Organs of the Pelvic Region of Swine

ORIG. PUB. : Sb. rabot Leningr. vet. in-t, 1956, vyp. 18, 171-174

ABSTRACT : It was demonstrated on the cadavers of 50 hogs, aged 3 weeks to 8 months, prepared by the Vorob'yev method, that branches of the pudendal, cutaneous caudal femoral, and the caudal hemorrhoidal nerve take part in the innervation of the organs of the pelvic region. The first two nerves participate in the pelvic plexus. The branches of the above-mentioned nerves, which lead towards the organs of the pelvic region can be permanent

CARD: 1/2

MUSTEYKAYTE, I., Cand Biol Sci -- (diss) "Nerves of Organs of the Pelvic Cavity of [redacted]." Len, 1957. 15 pp (Min of Agr USSR, Len Vet Inst), 100 copies (KL, 52-57, 105)

41441

S/120/62/000/005/023/036
E032/E314

AUTHORS: Mamyrin, B.A. and Mustrov, B.N.

TITLE: High-resolution mass-spectrometer with a two-stage time-of-flight separation of ions

PERIODICAL: Pribory i tekhnika eksperimenta, no. 5, 1962, 135 - 141

TEXT: This is a continuation of previous work reported by the authors in Ref. 7 (Zh. tekhn. fiz., 1957, 27, 6, 1347) and by the second of the present authors in Ref. 8 (Zh. tekhn. fiz., 1960, 30, 7, 860). The resonance mass-spectrometer described in the former paper suffers from various disadvantages, of which the main are 1) the presence of harmonics so that several peaks corresponding to a given mass may be obtained at different repetition frequencies applied to the modulator and 2) low output currents. The instrument reported in this paper was designed in order to minimise these disadvantages. The spectrometer is illustrated schematically in Fig. 1. The ion source has been described by the present authors in the first of the above two papers. It is a pulsed source in which the

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ion build-up occurs between extracting voltage pulses applied to the reflecting electrode 1 . Ion bunches are accelerated by the electrostatic field 2 and enter the metal dee A , which is maintained at a positive potential relative to the walls of the chamber. The ions receive an additional acceleration in the field 3 , so that they miss the source and enter the modulator M . The length of the ion bunches reaching the modulator is the same as at the source. The ions experience a trapezoidal voltage pulse in the modulator and are accelerated so that they leave the dee and enter the slit S_1 . Ions leaving S_1 have an energy spread due to its finite size. This energy spread is balanced when the ions re-enter the modulator for the second time and are accelerated by the tail of the trapezoidal voltage pulse, the time of flight being chosen appropriately. Hence, in the final part of their orbit, they travel on circles of equal radius ρ_2 and finally enter the output slit S_2 . The total ion energy after the two

S/120/62/000/005/023/036

High-resolution mass-spectrometer.. E032/E314

accelerations in the modulator depends on the relation between the time of flight in the drift orbit and the repetition frequency of the oscillator. Controlled variation of this frequency within a small range gives rise to a small change in the total energy increase and, correspondingly, in the radius $_2$. In this way, the ion beam may be swept across the slit S_2, giving an ion-current peak.. The magnetic field is produced by a permanent magnet (600 - 2 900 Oe), in which the field is adjusted by suitable magnetic shunting. The resolution of the spectrometer R (50%) is better than 10 000. The spectrometer is designed for the range m/e = 3 - 36. Fig. 53 shows the resolution obtained for the H^1Cl^{35} - Ar^{36} doublet. There are 7 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR
(Physicotechnical Institute, AS USSR)

SUBMITTED: October 30, 1961

Card 3/13

MUSTYATSA, G.I.

Response of oil-yielding lavender to fertilizers. Zemledelie 25 no.6:83-84 Je '63. (MIRA 16:7)

1. Glavnyy agronom sovkhoza-zavoda "Roza Moldavii", Leovskogo rayona, Moldavskoy SSR.
(Moldavia—Lavender(Plant)—Fertilizers and manures)

MUSTYATSA, G.I.

Characteristics of the development of the root system of lavender in Moldavia. Agrobiologia no.4:626-630 Jl-Ag '63. (MIRA 16:9)

1. Sovkhoz-zavod "Roza Moldavii", Leovskiy rayon, Moldavskoy SSR.
(Moldavia—Lavender (Plant))
(Roots (Botany))

MUSTYATSA, V., inzh.; SHUBIN, V., inzh.

Automatic measuring out of liquid gas in the filling of tanks. Zhil.-kom. khoz. 12 no.10:28-29 Ja '62. (MIRA 16:2)
(Liquified petroleum gas)