

21826

Tissue-equivalent dosimeter...

S/115/61/000/004/005/010  
B129/B206

X

mixing graphite with polyethylene. The tissue-equivalent chambers of the dosimeter are produced from pressed, carefully mixed powder consisting of 2.4 parts by weight of polyethylene and 1 part by weight graphite. The surface is homogeneous and smooth, which is important because of the reduction of adsorption of gases on the chamber walls. The conduction of the material was good; that of the surface, however, was irregular in various parts of the chamber. The calibration of the chambers in the field of the  $Co^{60}$  gamma rays showed that this fact was of no noticeable effect on the quantity of the ion current. In order to obtain the radiation equilibrium and to exclude the diffusion of the gas through the wall, the latter was made 5-mm thick, and the volume of the chamber was

953 ( $\pm$  3)  $cm^3$ . The central electrode of the chamber was made from the same plastic and mounted in the center of the chamber fixed by means of a polished insulator from polystyrene. The leakage currents through it were small compared with the ion currents to be measured. Fig. 1 shows the scheme of the ionization chamber. The body of the chamber consists of two parts which are glued together by a mixture of epoxy resin and polyamine. This mixture polymerized quickly at room temperature and was used for

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Tissue-equivalent dosimeter...

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B129/B206

mounting the inner electrode in the insulator and the insulator in the body of the chamber. A device was provided to produce a vacuum, fill the chamber with gases of required composition and seal the content hermetically from the ambient medium. An electric measuring device built by the "Etalon" Plant served for measuring the ionization current during irradiation of the chamber with neutrons. This circuit is shown in Fig. 3. It is a quadrant electrometer which is supplied with a stabilized voltage of 300 v. This electrometer was used for measuring either the potential at the condenser plates or the potential drop in the resistance. In the first case, the indication was proportional to the total dose, in the second case, proportional to the power of the dose. The calibration of the instrument, calculation of the current caused by the neutrons and the practical measurement with the instrument described are dealt with next. As a result of the studies, a tissue-equivalent dosimeter for fast neutrons was elaborated, which permits measurements of from 0.5 to some hundredths microrad/sec with an error of 7-12%. There are 10 figures, 2 tables, and 14 references: 4 Soviet-bloc and 10 non-Soviet-bloc. The four references to English language publications read as follows: Rossi H. H., Failla G. Nucleonics, 1956, 14 (no.2); Hughes D. J.,

X

Card 3/5

21826

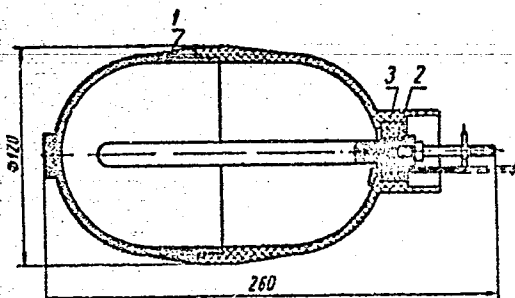
Tissue-equivalent dosimeter...

S/115/61/000/004/005/010  
B129/B206

X

Harvey I. A. Neutron cross sections, N-Y, Toronto, London 1955; Baum I.W. Neutron dosimetry - a review, 1955; Snyder W. S., Neufeld J. Brit. J. Radiology, 1955, 28 (no.331).

Legend to Fig. 1: 1) Body;  
2) insulated electrode;  
3) insulation material.



Фиг. 1

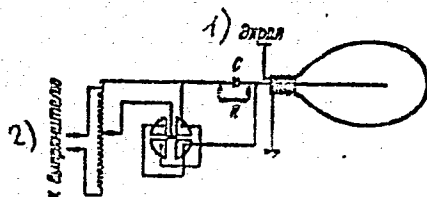
Fig. 1

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Tissue-equivalent dosimeter...

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B129/B206



Фиг. 3

Fig. 3

Legend to Fig. 3: 1) Screen; 2) to the rectifier.

Card 5/5

YUDIN, M.F.; BAL'YAN, L.G., red.; KASHIRIN, A.G., tekhn. red.

[Methods and equipment for calibrating radiation monitoring instruments] Metody i apparatura dlia graduirovki dozimetriche-  
skikh priborov. Moskva, Standartgiz, 1962. 117 p.

(MIRA 15:12)

(Radiation--Measurement)

L 19348-63 EWT(1)/EWT(m)/BDS/ES(j) AMD/AFPTC/ASD AR/K  
ACCESSION NR: AR3005189 S/0272/63/000/007/0163/0163

SOURCE: RZh. Metrologiya i izmer. tekhnika. Otd. vy\*p., Abs. 7.32.1100

AUTHOR: Yudin, M. F. 56

TITLE: Some corrections in the determination of <sup>19</sup>x-ray dosage by means of a 250-3000 kev calibration apparatus

CITED SOURCE: Tr. in-tov Kom-ta standartov, mer i izmerit. priborov pri Sov. Min. SSSR, vy\*p. 69(129), 1962, 56-69

TOPIC TAGS: radiation dosimetry, dosimeter calibration, Co. sup 60, gamma ray, measurement, dosimetry

TRANSLATION: The author considers the problem of introducing corrections for the penetration of radiation through the walls of a calibration diaphragm and scattering in the measurement of doses of  $\gamma$ -radiation from  $Co^{60}$  with the aid of a calibration apparatus. It is noted that in the assaying of test  $\gamma$ -emitters with the aid of the calibration apparatus, the correction for the penetration and scattering of radiation by the calibration diaphragm for  $Co^{60}$   $\gamma$ -rays is

Card 1/2

L 19348-63

ACCESSION NR: AR3005189

about 0.945. The correction for air scattering in the measurement of  $Co^{60}$   $\gamma$ -rays varies from 0.988 for an air pressure of 8 atm to 0.972 for a pressure of 20 atm. Five illustrations. Six tables. E. Vtyurina.

DATE ACQ: 24Jul63

SUB CODE: GE, NS

ENCL: 00

Card 2/2

2 11888-05 0011888 DTAAF

AM5000781

RUSSIAN

Yudin, Mikhail Fedorovich; Neutrony, [Leningrad, 1971]

Neutron desirability (Neptromnaya desirability) [Leningrad, 1971]  
FIZMATEKH, Leningrad, 1971, 140 p., 140 illustrations.  
Scientific editor: G. A. Bar'yanov; Editorial board  
editor: V. A. Zhuravleva.

TOPIC TAGS: neutron desirability, neutron desirability  
neutron radiation, parietry

PURPOSE AND SCOPE: This book is devoted to the  
and calibration of neutron detectors, parietry  
for those who are engaged in the study of  
specialization of the field of neutron  
gives a detailed description of the  
various types of neutron detectors and  
characteristics of their operation.  
interactions of neutrons with matter and  
neutron dosimetry.

1971/7



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AMCO00001

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TABLE OF CONTENTS

Front matter .....  
Chapter I .....  
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Appendix .....  
Appendix .....

2 15 199

AMROOJ (0)

SUN CODE: AF

GU: 1 1 1 1 1 1 1

OTHER: 199

0003/3

YUDIN, M.F.; YANOVSKIY, A.P.

Scattering of neutron radiation during the graduation of dosimeters  
and emitters. Nov. nauch.-issl. rab. po metr. VNIIM no.2:43-45 '64.

Apparatus for neutron dosimetry. Ibid.:66-70 (MIRA 18:4)

SHIROKOV, K.P.; YUDIN, M.F.

The 6th session of the Technical Committee No. 2 of the  
International Standards Organization. Izv. tekh. no. 2:51-52  
F '64. (MIRA 17:4)

KARAVAYEV, F.M.; YUDIN, M.F.

New state standard 8848-63 "Radioactivity and ionization radiation  
units." Izv. tekhn. no. 6:51-53 Je '64. (MIRA 17:12)

TUCHIN, V.N.; OSTROMUKHOVA, G.P.; YUDIN, M.F.

Effect of a collimating device on the graduation and testing of  
roentgenometers (dosimeters) by means of standard gamma ray sources.  
Izm. tekhn. no.3:58-61 Mr '65. (MIRA 18:5)

L 38475-66 EWT(m)

ACC NR: AR6017219

SOURCE CODE: UR/0058/65/000/012/A063/A063

AUTHOR: Yudin, M. F.

TITLE: Ionizing radiation dosimetry 19

SOURCE: REF. zh. Fizika, Abs. 12A538

REF SOURCE: Tr. in-tov Gos. kom-~~ta~~ standartov, mer i izmerit. priborov SSSR, vyp. 76(136), 1965, 152-159

TOPIC TAGS: radiation dosimetry, ionizing radiation

ABSTRACT: The paper gives a brief review of basic studies in ionizing radiation dosimetry carried out by the x-ray laboratory of VNIIM from the time of its organization to the present. Main trends of studies by the laboratory for the immediate future are indicated. Bibliography of 61 titles. [Translation of abstract] [KP]

SUB CODE: 18/ SUBM DATE: none

Card 1/1 pb

VILLEVAL'DE, N.D.; LYSANOV, Yu.V.; SKOTNIKOV, V.V.; KHLEBNIKOV, K.K.; YUDIN, M.F.

The 50 Mev. betatron at the All-Union Scientific Research Institute of  
Metrology. Prikl. i tekhn. ekspt. fiz. 1973-1974. Ja-P. 1974. 219-220.

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii.



ACC NR: AP7000128

SOURCE CODE: UR/0115/66/000/011/0015/0017

AUTHOR: Yudin, M. P.

ORG: none

TITLE: Equivalent dose and units for its measurement

SOURCE: Izmeritel'naya tekhnika, no. 11, 1966, 15-17

TOPIC TAGS: ionizing radiation biologic effect, relative biologic efficiency, radiobiology, x ray radiation biologic effect, radiation shielding, radiation safety, radiation dosimetry

ABSTRACT: The author would modify the present practice of expressing the relative biological effect (RBE) of both quantum and corpuscular radiation in the form of a ratio based on quantum radiation (x-rays) alone. Two modifications are necessary: 1) introduction of a quality factor (QF), uniquely characteristic of each type of radiation, to take care of the difference in biological effect of identical doses of various kinds of radiation; and 2) the basing of all calculations on the absorbed tissue dose (expressed in rads) rather than on the external radiation dose (exposure) in roentgens. The precise values of the quality factors for various kinds of radiation will need to be established by worldwide research. The author gives the following table of approximations:

Card 1/3

UDC: 577.391(017)

ACC NR: AP7000128

Table 1.

Type of particle	Average specific ionization in water, ion pairs $\cdot$ m <sup>-1</sup>	Average energy transfer in water, kev $\cdot$ m <sup>-1</sup>	Quality factor (QF)
Quantum radiation, electrons, positrons	100 or less	3.5 or less	1
Heavy ionizing particles	100 or less	3.5 or less	1
	100—200	3.5—7.0	1—2
	200—650	7.0—23	2—5
	650—1500	23—53	5—10
1500—5000	53—175	10—20	

The author would restrict the present concept of biological (RBE) dose, expressed in bar units, to biological objects other than man. In its place he proposed that all research on shielding and human radiation safety (i.e., studying radiation effects on man) use the "equivalent dose." Equivalent dose will correspond to

Card 2/3

ACC NR: AP7000128

(but not precisely equal) the product  $DK$ , where  $D$  is the tissue dose in rad, and  $K$  is the quality factor applicable to that type of radiation. Equivalent dose ( $ED$ ) will be expressed by the unit "equivalent rad" (eq. rad). [DP]

SUB CODE: 18, 06/ SUBM DATE: 03May66/ ORIG REF: 001/ OTH REF: 003/  
ATD PRESS: 5110

Card 3/3

YUDIN, M.G.

High-frequency correction in nondirectional microphones with  
moving coil. Trudy LKI no.10:27-31 '64. (MIRA 18:9)

1. Kafedra akustiki Leningradskogo instituta kinoinzhenerov.

KORESHEV, G.P.; YUDIN, M.G.

Calculating the friction in a nondirectional microphone with  
moving coil. Trudy LIKI no.10:33-35 '64. (MIRA 18:9)

1. Kafedra akustiki Leningradskogo instituta kinoinzhenerov.

MEHAROKOV, M.I.; CABUZINA, A.G., starshiy nauchnyy sotrudnik;  
YUDIN, M.I., starshiy agronom-inspektor

Dodder and its control. Zashch. rast. ot vred. i bol.  
5 no. 8:50 Ag '60. (MIRA 13:12)

1. Zamestitel' direktora Pavlovskogo opytnogo lugovogo polya  
(for Menarokov). 2. Voronezhskaya stantsiya zashchity rasteniy  
(for Lubuzina). 3. Voronezhskaya gosinspektsiya po karantinu  
rasteniy (for Yudin).

(Dodder)

YUDIN, M. I., ed.

Physics of the atmosphere. Sverdlovsk, Gidrometeoizdat, 1945. 83 p. (NKO SSSR. Glavnoe upravlenie gidrometeorologicheskoi sluzhby SSSR. Trudy nauchno-issledovatel'skikh uchrezhdenii. Ser. 1: Meteorologiya, vyp. 7) (54-32128)

QC915.I8

YUDIN, M. I.

5162 2359  
The General Case of Locating a Point on a Plane  
by Three Angle Measurements.—M. I. Yudin  
(C. R. Acad. Sci. U.R.S.S., 10th Dec. 1943, Vol.  
19, No. 7, pp. 472-475. In English) An exten-  
sion of the author's paper (Bull. Acad. Sci. U.R.S.S.,  
ser. *fiz. i matemat. nauk*, 1944, Vol. 8, No. 13,  
p. 19) on (in Russian) to a case where the errors  
in angular measurement are not independent.  
Formulas are given which determine the position of  
the most probable point and the accuracy achieved.  
Aerial, natural and aural direction-finding applica-  
tions are mentioned.



YUDIN, M. I.

PA 4T112

USSR/Meteorology

1945

"The Theory of Diffusion of Bodies of Finite Dimensions in a Turbulent Atmosphere," M. I. Yudin, 4 pp.

"CR Acad Sci" Vol XLIX, No 8

A discussion and correction of L. Richardson's formula for determining eddy diffusivity from the diffusion of falling particles, clarifying the effect of the velocity of fall on the diffusion of particles in the atmosphere.

4T112

YUDIN, M. I. (Editor)

Physics of the Layer of Air Near the Ground (Symposium of Articles), Works of the Sci-Res  
Institution of the Main Administration of Hydrometeorological Service SSSR, Series 1,  
No 28. Hydrometeorological Press, Leningrad-Moscow; 1946. 94 pp (Main Geophysics  
Observatory.)  
(Meteorologiya i Gidrologiya, No 6 Nov/Dec 1947)

SO: U-3218, 3 Apr 1953

YUDIN, M. I.

Voprosy teorii turbulentnosti i stuktury vetra s prilozheniem k zadache o kolebaniakh samoleta. Leningrad, Gidrometeorologicheskoe izd-vo, 1946. 99 p., tables. (Russia-1923. Glavnoe upravlenie gidrometeorologicheskoi slushby. Trudy nauchno-issledovatel'skikh uchreshdenii. Seriya I; Meteorologiya, no. 25)

Title tr.: Theoretical questions of turbulence and wind structure applied to the problem of oscillations of an aircraft.

TL574. V5.18

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

YUDIN, M. I.

"Problems in the Theory of Turbulence and Wind Structure," Trudy NIU  
GUCMS, Series 1, No 35, 1946.

YUDIN, M. I.

"Research on the Course of Atmospheric Pressure on the Basis of Materials  
from II VPG by the Method of Separating Disturbances," Trudy OGO, No 10,  
Teoryticheskaya meteorologiya (Theoretical Meteorology), (2), 1946.

Source: Mathematical Reviews,

Yudin, M. I.

Sep 1946

USSR/ Physics  
Atmosphere - Temperature  
Heat - Transference

" Conditions of Thermal Equilibrium in the Atmosphere," M. I. Budyko, M. I. Yudin, 4 pp

" Comptes Rendus (Doklady)" Vol LIII, No 7

Mathematical discussion of the heat exchange in the atmosphere, and of atmospheric turbulence or eddies. It is concluded that the lapse rate of temperature is 6 c/km. The authors recommend the abandonment of the generally-accepted opinion that a mean eddy heat flow exists in the vertical direction from the atmosphere toward the ground.

YUDIN, M. I.

Meteorological Abst.  
Vol. 4 No. 2  
Feb. 1953  
Bibliography on  
Turbulent Exchange

4B-148 ✓ 551.554  
Yudin, M. I. Prikladnye problemy ucheniya ob atmosfere i turbulentnosti. [Applied problems of atmospheric turbulence.] *Meteorologiya i Gidrologiya*, 3:3-10, 1947. 29 refs. DWB—The author shows the close connection between turbulence and various aspects of human activity by enumerating over thirty practical problems depending upon the laws of turbulent motion. The physical bases of the great majority of applications of the theory of atmospheric turbulence can be classified as follows: Turbulent vertical transfer of heat, moisture, and mass near the underlying surface; the theory of turbulent diffusion of mixtures in the atmosphere, and analysis of the structure of the fields of wind, temperature, and pressure. Each of these groups is analyzed, with emphasis on its practical significance. *Subject Headings:* 1. Turbulent exchange 2. Turbulent diffusion 3. Wind structure. —C.K.

YUDIN, M. I.

SOLOVEYCHIK, R. E. and YUDIN, M. I., "Investigations by the Soviet School of Meteorologists-  
Theoreticians," No 5, pp 13-21.  
(Meteorologiya i Gidrologiya, No 6 Nov/Dec 1947)

SO: U-3218, 3 Apr 1953



YUDIN, M. I.

Jan/Feb 48

USSR/Meteorology - Lapse Rate  
Heat Exchange

"Heat Exchange of the Earth's Surface With the Atmosphere and the Equilibrium  
Temperature Gradient," M. I. Budyko, M. I. Yudin

"Meteorol i Gidrol" No 1, pp 16-30

Proves "Schmidt paradox" is erroneous. Schmidt, in contrast to generally accepted notion,  
concluded average turbulent heat flow is directed from atmosphere to earth, using equilib-  
rium temperature gradient of 5-6° C/km.

PA 167T91

FA 170T80

YUDIN, M. I.

USSR/Meteorology - Turbulence

Dec 48

"Notes on the Richardson Criteria and Number,"  
M. I. Yudin

"Meteorol i Gidrol" No 6, pp 79-81

Argues against conclusion which follows directly from Richardson's criteria that turbulent energy must always increase, no matter how high its initial level, for indifferent state of the atmosphere and even more so for unstable stratification. Submitted 24 Jul 48.

170T80

IS 1/49762

YUDIN, M. I.

ISSN 0013-788X  
USSR Academy of Sciences  
Atmospheric Measurements

"Daily Report of Temperature of the  
Conductivity Heat Exchange" M. I. Yu.

172 Akhmatovsk, Ser George: Geofiz. ... X. ...

Reports investigations of perturbations of air  
giving daily sums of turbulent heat exchange  
on basis of atmospheric temperature and wind speed  
at any given height. Given solution to program  
for determining temperature curve on basis of  
turbulent exchange. Same methods can be applied

1/4976

USSR/Geophysics (Cont'd) June-Aug 43

for calculating daily humidity and wind regimes  
at given altitudes. Submitted by Acad O. Yu.  
Shmidt 6 Jun 1948.

1/4976

LYAPIN, Ye. S. and YUDIN, M. I. (Editors)

"Works of the Main Geophysical Observatory," 1949

Symposium of nine authors - twelve reports on problems of atmospheric turbulence.

B-75897

YUDIN, M. I.

Meteorological Abst.  
Vol. 4 No. 2  
Feb. 1953  
Bibliography on  
Turbulent Exchange

551.511 551.551

45-221 ✓  
 Yudin, M. I. Nekotorye voprosy teorii meteorologicheskikh polei. [Some problems of the theory of meteorological fields.] Leningrad, Gosmoia Geofizicheskoi Observatorii. Trudy, 19(81):288-314, 1950. 2 figs., 4 tables, 26 refs., 31 eqs. DLC—A lengthy discussion of the application of theory of turbulent motion to physical (especially atmospheric) media. Optimum conditions in time and space, for use of theoretical determinations, and variations from these optimum conditions, the structure of the temperature and pressure fields and lastly errors in interpolation for space or time in temperature or wind. Calculations are treated theoretically and empirically in the light of the statistical theory of turbulence. Subject Headings: 1. Statistical theory of turbulence 2. Atmospheric turbulence.—M.R.

EH  
6-11-54

YUDIN, M. I.

Meteorological Abst.  
Vol. 4 No. 2  
Feb. 1953  
Bibliography on  
Turbulent Exchange

48-223 ✓ 551.551:551.556.2:632.1

Yudin, M. I. *Vliyanie iznykh polos na turbulentnyi obmen i optimal'naya shirina polos.* [Influence of the shelter belts on turbulent exchange and the optimal width of the belts.] *Akademiia Nauk, SSSR, Doklady*, 71(4):635-638, April 1950. 6 refs., 5 eqs. DLC—A shelter belt reduces not only the wind speed but what is more important for agriculture, it reduces the turbulent exchange by breaking up the big eddies and forming many small random eddies. Experiments made in 1949 by the Div. of Applied Meteorology of the Central Geophysical Observatory (Leningrad), in connection with theoretical calculations, lead to the conclusion that for belts of sparse trees the optimum width would be from 8 to 25 meters. (Same item as 2.6-82, June 1951, MAB.) *Subject Headings:*  
1. Turbulent exchange 2. Shelter belts.—M.R.

EH  
6-11-54

YUDIN, M. I.

AID 20 - II

PHASE II

TREASURE ISLAND BIBLIOGRAPHICAL REPORT

BOOK

Authors: ZVEREV, A. S., KIRYUKHIN, B. V., KONDRAT'YEV, K. Ya., SELEZNEVA, Ye. S.,  
TVERSKOY, P. N., YUDIN, M. I.

Call No.: QC 861.T85

Full Title: COURSE OF METEOROLOGY (PHYSICS OF THE ATMOSPHERE)

Transliterated Title: Kurs meteorologii (Fizika atmosfery)

Publishing Data

Originating Agency: None

Publishing House: Hydrometeorological Publishing House (GIMIZ)

Date: 1951

No. pp.: 888

No. of copies: 10,000

Editorial Staff

Editor: Professor Tverskoy, P. N.

Editor-in-Chief: None

Others: 1) Scientific Council and the scientific personnel of the Main Geophysical  
Observatory, 2) Prof. Khromov, S. P., who critically analysed the manuscript.

Tech. Ed.: None

Appraiser: None

Text Data

Coverage: A fundamental course in the physics of the atmosphere, covering its  
properties, methods of investigation, application of thermodynamics,  
radiant energy, heat energy, water vapor, motion, weather and its  
forecasting, atmospheric optics, electricity, and acoustics.

YUDIN, M. I.

Mar/Apr 51

USSR/Geophysics-Quantitative Study

Discussions: "Problem of Quantitatively Calculating Variations in Natural Conditions,"  
M.I. Budyko, O.A. Drozdov, M.I. Yudin

"Iz Ak Nauk, Ser Geog" No 2, pp 57-61

Development of Soviet phys geography is valuable for hydrometrical surveys comprising: meteorology, climatology, hydrology of land and sea, based on Stalin's plan to change of nature. Works by members of the Hydrometrical Survey (K. I. Kashin, Kh. P. Pogosyan, M. I. Budyko, and O. A. Drozdov) proved that atm pptns depend little on soil evapn. Other members of this Survey (A.R. Konstantinov, M. I. Lvovich, S. A. Sapozhnikova, M.I. Yudina) plan forest improvements.

PA 196167



YUDIN, M.I.

TREASURE ISLAND BIBLIOGRAPHICAL REPORT

AID 624 - I

PHASE I

Call No.: AF 501068

BOOK

Authors: Doctors of Physico-Mathematical Sciences BUDYKO, M. I. and Prof. YUDIN, M. I., Doctors of Geographical Sciences, Profs. DROZDOV, O. A., L'VOVICH, M. I., POGOSYAN, Kh. P., and SAPOZHNIKOVA, S. A.

Full Title: CLIMATIC CHANGES IN CONNECTION WITH THE PROJECT FOR THE TRANSFORMATION OF NATURE IN THE ARID REGIONS OF THE USSR

PUBLISHING DATA

Originating Agency: None

Publishing House: Hydrometeorological Publishing House

Date: 1952

No. pp.: 206

No. of copies: 3,000

Editorial Staff

Editor: Prof. Dr., Kh. P. Pogosyan

PURPOSE: Presentation in concise systematic form of the results of fundamental studies of climate amelioration by hydrometeorological institutes and the recommendations to be followed by those interested in climate transformation.

TEXT DATA

Coverage: The monograph is divided into seven chapters and a concluding chapter, the chapters being subdivided into several sections.

YU. DIN, M. T.

24  
(12) Geo

Meteorological Abst.  
Vol. 5 No. 1  
Jan. 1954  
Part 1  
Structure and Physics  
of the Atmosphere

5.1-123 ✓ 551.511:551.515.8  
Berliand, M. E. and Dobryshman, E. M., Soveshchanie po voprosam issledovaniia transformatsii vozdukh. [Conference on the question of investigating the transformation of air.] Meteorologiya i Gidrologiya, No. 8:49-50, Aug. 1952. DLC--Review of meetings held by the Central Geophysical Observatory in cooperation with the Central Aerological Observatory, Central Institute of Weather Forecasting and Geophysical Observatories of Tashkent, Kiev and Minsk. The adiabatic air transformation (report by S. S. GAIKEROV), heat transformation of cold air masses (by M. V. ZAVARINA), heat transformation of air masses (by M. E. BERLIAND) and actinometric investigations of free atmosphere (by V. G. KASTROV and E. A. LOKUHINA) were discussed. Special reports on air transformation over the irrigated regions were made by P. A. VORONISOV (agronomical problem) and M. I. YUDIN (change of climate). Subject Headings: 1. Air masses. 2. Energy transformation 3. Conferences.—N.T.Z.

BUDYKO, M.I.; DROZDOV, O.A.; L'VOVICH, M.I.; POGOSYAN, Kh.P.; SAPOZHNIKOVA, S.A.;  
YUDIN, M.I.

Regularities of climatic changes with respect to the realization of the  
Stalin plan of transformation of nature. Vop.geog. 28:66-73 '52.  
(MIRA 7:5)

1. Gidrometsluzhba. (Meteorology, Agricultural) (Windbreaks, shelter-  
belts, etc.)

AVAKYAN, A.B.; BUDYKO, M.I.; YUDIN, M.I.; OCHAKOVSKIY, Yu.Ye.; DAVYDOV, M.H.;  
ARMAND, D.L.; FEDOROVICH, B.A.; ZUBOV, N.N.; ANTIPOR-KARATAYEV, I.N.;  
SAPOZHNIKOVA, S.A.; ALISOV, B.P.; FOTSEYEV, I.M.

Discussion of reports of the meeting. Vop.geog. 28:74-96 '52. (MLRA 7:5)

1. Gidroenergoprojekt Ministerstva elektrostantsiy (for Avakyan).
2. Glavnaya geofizicheskaya observatoriya im. A.I.Voyeykova (for Budyko and Yudin).
3. Institut okeanologii Akademii nauk SSSR (for Ochakovskiy).
4. Gidroenergoprojekt Ministerstva elektrostantsiy (for Davydov).
5. Institut geografii Akademii nauk SSSR (for Armand, Fedorovich, and Fotseyev).
6. Geograficheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta (for Zubov and Alisov).
7. Pochvennyy institut im. V.V. Dokuchayeva Akademii nauk SSSR (for Antipov-Karatayev, I.N.).
8. Glavnaya geofizicheskaya observatoriya im. A.I.Voyeykova (for Sapozhnikova).

Yudin, M.I.  
BUDYKO, M.I.; YUDIN, M.I.

Experimental investigation of the meteorological efficiency of field  
protecting tree shelterbelts. Trudy GGO no.29:105-113 '52.  
(Windbreaks, shelterbelts, etc.) (MIRA 11:1)

YUDIN, M.I.

Application of the statistical theory of turbulence to the  
simplification of equations describing atmospheric dynamics.  
Trudy GGO no.33:5-19 '52. (MIRA 11:1)  
(Atmospheric turbulence)  
(Meteorology)

USSR.

The USSR...  
The USSR...  
The USSR...

... In this paper the author eliminates the defect

YUDIN, M. I., YAKOVLEVA, N. I. and BUDYKO, M. I.

"Evaporation From Irrigated Regions and Evaporability".  
Meteorol. i Gidrologiya, No 1, pp 7-10, 1954.

Computations of evaporability for large and small irrigated territories under various climatic conditions are considered. It is pointed out that in the determination of evaporability from small territories under conditions of a dry climate one must take into account the dependence of evaporation upon the dimensions of the wetted surface, since evaporability from large wetted territories is markedly less than from small areas. The difference in the magnitudes of evaporability appears mainly for irrigated areas of less than one kilometer extent, especially for areas of less than 100 meters, size. Under conditions of a wet climate the difference in evaporation from large and small wetted surface is small. The presence of blow-through forest belts in irrigated fields ensures decrease of evaporation from fields by 7-14%, thus lessening the irrigation norm. (RZhGeol, No 11, 1955)

SO: Sum No 884, 9 Apr 1956



YUDIN, MIKHAIL ISAAKOVICH

PHASE I BOOK EXPLOITATION

14

Gandin, Lev Semenovich; Laykhtman, David L'vovich; Matveyev, Leonid Tikhonovich;  
and Yudin, Mikhail Isaakovich

Osnovy dinamicheskoy meteorologii (Principles of Dynamic Meteorology) Leningrad,  
Gidrometeoizdat, 1955. 646 p. 4,000 copies printed.

Ed. (title page): Laykhtman, D. L., Professor, and Yudin, M. I., Professor;  
Responsible Ed.: Pyatygin, K. V.; Ed. (inside book): Vlasova, Yu. V.;  
Tech. Ed.: Soloveychik, A. A.

PURPOSE: This book, which is a treatise on dynamic meteorology developed by  
the author in the course of lecturing at various universities, is  
intended as a textbook for meteorology students of vuzes and as a  
handbook for specialists in the field of meteorology and climatology.

COVERAGE: The book examines the basic methods of dynamic meteorology, making  
extensive use of mathematical treatment in analyzing the physical  
processes taking place in the atmosphere. The latest developments

Card 1/13

YUDIN, M. I.

"Invariant Values in Large-Scale Atmospheric Processes," by  
M. I. Yudin, Tr. Gl. geofiz. observ., No 55, 1955, pp 3-12  
(from Referativnyy Zhurnal -- Fizika, No 9, Sep 56, Abstract  
No 27154)

The article is devoted to the determination of values remaining unchanged during atmospheric motions on a large scale. The analysis is based on the order of smallness of the various terms of atmospheric dynamics equations, expressing motion for which the relation of the geostrophic deviation to wind velocity is a smaller number. Using these positions as well as tables of the order of meteorologic elements and of its derivatives, a classification of terms of the equation of the vortex is made according to their order of magnitude. It is shown that the potential and the absolute vortices previously considered as invariants really remain invariable only in some particular conditions. All these conclusions hold only in the free atmosphere and under condition of adiabatic motion.

Sum 1219

BERLYAND, Mark Yevseyevich; YUDIN, M.I., otvetstvennyy redaktor;  
MAKSIMOVA, I.G., redaktor; BRATINA, M.I., tekhnicheskiy redaktor

[Prediction and control of heat conditions in the air near the  
ground] Predskazanie i regulirovanie toplivogo rezhima prizemnogo  
sloia atmosfery. Leningrad, Gidrometeorologicheskoe izd-vo, 1956.  
434 p. (Weather forecasting) (Atmospheric temperature) (MLRA 9:7)

YUDIN, M. I.

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 4, p 88 (USSR)  
SOV/124-58-4-4298

AUTHOR: Yudin, M. I.

TITLE: The Variation of Meteorological Elements With Time and Space  
(Izmenchivost' meteorologicheskikh elementov v prostranstve  
i vremeni)

PERIODICAL: V sb.: A. I. Voyeykov i sovrem. probl. klimatol. Leningrad,  
Gidrometeoizdat, 1956, pp 175-192

ABSTRACT: A review article. A. I. Voyeykov's interest is noted in the studies of periodic and nonperiodic meteorological changes with respect to time. The article enumerates the basic works of Soviet and foreign authors related to nonperiodic changes. The most important results of the research are indicated, and their significance for weather forecasting is stressed. Further, the article considers data related to the changes of meteorological elements with space. The article deals with data related to the variation of the mean pressure difference between two stations as a function of the distance between them; the influence of the direction of the line connecting the two stations is considered and is shown to be of extreme importance. In this connection,

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SOV/124-58-4-4298

### The Variation of Meteorological Elements With Time and Space

and along with the usual correlational and structural functions, additional statistical characteristics depending on the distance  $l$  alone are introduced. (The said usual functions depend generally on two values, namely, the distance between the two observation points and the direction of the line between these points. The statistical characteristics are as follows: correlational and structural functions averaged relative to direction, and the scatter of the mean of the quantity  $f$  over a circle of the given radius  $l$ , which is called by the author the total-correlation function of  $f$ .)

The article gives new data on the structure of the humidity and geopotential fields at different levels of the atmosphere. Basic results are given on the connection between the structural functions and the mean values of the derivatives of the meteorological fields. A table with collected characteristic values of all the mean first and second derivatives (for space, time, and both combined) of the basic meteorological fields in the layer from 0 to 5 km. There are notes on the subject of variation of the order of magnitude of the mean derivatives as a function of the scale factors of the processes considered; these variations are illustrated by a special table. In conclusion the author indicates a number of values (geostrophic vorticity, advective geostrophic variation of the vorticity and temperature), the detailed study of which is required by the modern development of dynamic meteorology and

Card 2/3

SOV/124-58-4-4298

The Variation of Meteorological Elements With Time and Space  
the numerical forecasting methods, but which to date has been entirely in-  
adequate.

A. M. Yaglom

1. Meteorology--Statistical analysis

Card 3/3

YUDIN, M.I.

Determining the position of a point on the plane taking into account systematic errors of measurements. Trudy GGO no.56:69-78 :56.

(Navigation (Aeronautics)) (Errors, Theory of) (MIRA 15:6)

YUDIN, M.I.

Numerical methods for forecasting pressure fields. Trudy GGO  
no.71:3-33 '57. (MIRA 10:10)  
(Atmospheric pressure) (Weather forecasting)



YUDIN, M.I.

36-71-11/16

**AUTHOR:** Yudin, M. I., Ledneva, K. V.**TITLE:** Structural Function of the Field of Absolute Humidity  
(Strukturnaya funktsiya polya absolyutnoy vlazhnosti)**PERIODICAL:** Trudy Glavnoy geofizicheskoy observatorii  
, 1957, Nr 71, pp. 156-162 (USSR)

**ABSTRACT:** A better knowledge of the distribution of humidity fields is desirable in order to improve meteorological observations. The structural field of absolute humidity, which is nothing else but the distribution of water-vapor pressures, is expressed by a formula and differs from specific humidity by a multiplication factor only. The structural field of specific humidity follows the temperature pattern. Such relationships permit the construction of graphs corresponding to observations made by various stations in different latitudes over a long period of time. The published graphs for spring (April) and summer (July) led to formulation of a linear law (proportional to saturating humidity), adequate even for very large distances (600-800 km). However, the spread of values for coastal and continental stations is quite noticeable. Coincidence of structural temperature fields, humidity and wind

Card 1/2

Structural Function of the Field of Absolute Humidity (Cont.) 36-71-11/16  
components permits formulation of some principles of dynamic  
meteorology. There are 3 figures, 4 tables and 1 USSR reference.

AVAILABLE: Library of Congress

Card 2/2

YUDIN, M.I.

Forecasting wind fields and their associated meteorological elements.  
Dokl.AN SSSR 112 no.1:49-52 Ja '57. (MIRA 10:2)

1. Predstavleno akademikom A.L.Dorodnitsynym.  
(Winds)

YUDIN, M.I.

20-5-37/48

AUTHOR: Yudin, M. I.

TITLE: Nature of Striated and Ptygmatic Textures of Hyperbasites of the Borus Mountain Ridge (O prirode poloschatykh i ptigmatitovykh tekstur giperbazitov khr.Borus)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 5, pp. 851 - 854 (USSR)

ABSTRACT: In 1955 the author found in the Borus chain (West Sayan) fresh hyperbasites with extended striated structure which were scarcely serpentized. These textures are morphologically and genetically very similar to the pseudo-ptygmatic textures of the granitized rocks and to the mygmatites (reference 4). As far as it is known, similar formations in ultra-basic rocks were never found. 2 types of striated textures were observed: 1.) the first type is characterized microscopically by the occurrence of a parallel system of small olivine veins in a pyroxenite to a great extent transformed into talc (figure 1). These pyroxenite striae are ash-grey and broadest (4 - 10 cm). Olivine forms striae of a breadth of from 0,5 to 4 cm and is quite fresh. The mineralogical composition under the microscope is described. Talc seams the pyroxene relics and separates them from olivine. Sometimes pyroxene is directly replaced by olivine. Tremolite occurs seldom. 2.) The second type of striat-

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20-5-37/48

Nature of Striated and Ptygmatic Textures of Hyperbasites of the Borus  
Mountain Ridge

ed texture is formed alternatively by a) broad dark-greenish-grey dunite striae and b) smaller dark grey or black pyroxene striae. Pyroxene is more weathering resistant than olivine, a fact which makes the striae of the first stand out in relief like ribs. Ptygmatic structures are formed where in fragments of massive, not schistose dunite folded "veins" of the same coarse crystalline pyroxenite are visible which also forms the small plate-xenolites in dunite. The pyroxenites of the two species of texture are described macro- and microscopically. The author was convinced by the macroscopical observations that in all cases where pyroxenites and dunites occur together the first represent earlier formations than the latter. All texture varieties differ only morphologically from one another and are genetically products of the same process. On the strength of the above-mentioned the author says that none of the textures described here can be counted to the magmatogenic formations; furthermore the author is of the opinion that the formation of rocks of not uniform composition: pyroxenite - dunite is a result of metasomatic processes which were expressed as at least 2 stages; these stages were separated from each other in time by a tectonic phase. Only by this the occurrence of cataclasis in pyroxenites and its complete lack in the dunites can be explained.

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20-5-37/48

Nature of Striated and Ptygmatic Textures of Hyperbasites of the Borus Mountain Ridge

The replacement of each of these stages of the metasomatism was markedly selective. There are 4 figures, and 5 references, 4 of which are Slavic.

ASSOCIATION: Tomsk Polytechnical Institute im.S.M. Kirov  
(Tomskiy politekhnicheskii institut im. S. M. Kirov.)

PRESENTED: March 5, 1957, by D. S. Korzhinskiy, Academician

SUBMITTED: March 2, 1957

AVAILABLE: Library of Congress

Card 3/3

YUDIN, H. I.

"Heavy Particle Diffusion"

paper presented at Intl. Conf. on Atmospheric Diffusion and Air Pollution,  
Oxford, UK 24-29 Aug 58.

*Cent. Phephup Observatory, Leningrad*

YUDIN, M-I.

AUTHOR: <sup>12</sup> None Given

SOV/50-58-6-22/24

TITLE: Transactions of the Scientific Research Institutes of the  
"Hydrometeorologic" Service in 1957 (Trudy nauchno-issledovatel'skikh uchrezhdeniy Gidrometeoslužby za 1957 g.)  
Continuation (Prodolzheniye)

PERIODICAL: Meteorologiya i gidrologiya, 1958, Nr 6, pp. 61 - 63 (USSR)

ABSTRACT: Transactions of the Geophysical Main Observatory imeni A. I. Voyeykov (Trudy Glavnoy geofizicheskoy observatorii im. A. I. Voyeykova) Periodical Nr 67. Research problems of clouds of mighty convection and of the zones of thunderstorm activity. Editor: V. V. Bazilevich, 153 pages, 11 articles.  
Periodical Nr 68. Problems of actinometry and atmospheric optics. Editor: K. S. Shifrin and V. L. Gayevskiy, 208 pages, 18 articles.  
Periodical Nr 69. Problems of the physics of the ground-near layer of the atmosphere. Editor: D. L. Laykhtman, 107 pages, 16 articles.  
Periodical Nr 70. Problems of general climatology. Editor: O. A. Drozdov, 135 pages, 6 articles.

Card 1/3



SOV/50-58-6-22/24

Transactions of the Scientific Research Institutes of the "Hydrometeorologic"  
Service in 1957. Continuation

Periodical Nr 71. Problems of the numerical forecast and of  
climate theory. Editor: M. I. Yudin, 236 pages, 16 articles.

Periodical Nr 72. Problems of atmospheric physics. Editor:  
A. P. Chuvayev, 151 pages, 13 articles.

Periodical Nr 73. Atmospheric physics. Editor: V. V. Bazile-  
vich, 132 pages, 11 articles.  
(Periodical Nr 74 is not given).

Periodical Nr 75. Glazed frost and hoar-frost. Editor: O. A.  
Drozdov, 91 pages, 4 articles.

Transactions of the State Hydrological Institute (Trudy Gosudarst-  
vennogo gidrologicheskogo instituta)

Periodical Nr 59. Experimental investigation of the elements  
of the water balance in Valday. Editors: A. R. Konstantinov  
and V. V. Kupriyanov, 224 pages, 6 articles.

Periodical Nr 60. Problems of the hydrology of swamps. Editor:  
K. Ye. Ivanov, 108 pages, 6 articles.

Periodical Nr 61. Problems of the flow formation and the meth-  
ods for its calculation. Editor: D. L. Sokolovskiy, 306 pages,  
11 articles.

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SOV/50-58-6-22/24

Transactions of the Scientific Research Institutes of the "Hydrometeorologic"  
Service in 1957. Continuation

Periodical Nr 62. Problems of hydrometry. Editor: A. K. Proskuryakov, 108 pages, 6 articles.  
(Periodical Nr 63 is not mentioned).

Periodical Nr 64. Problems of the construction of hydrological apparatus. Editor: K. D. Zav'yalov, 58 pages, 6 articles.  
(Periodical Nr 65 is not mentioned).

Periodical Nr 66. Research problems of lakes and reservoirs. Editor: A. P. Domanitskiy, 140 pages, 5 articles.

1. Scientific reports--USSR    2. Meteorology    3. Hydrology

Card 3/3

Yudin, M. I.  
3(7)

PHASE I BOOK EXPLOITATION

SOV/2547

Leningrad. Glavnaya geofizicheskaya observatoriya

Voprosy dinamicheskoy meteorologii (Problems in Dynamic Meteorology)  
Leningrad, Gidrometeoizdat, 1959. 91 p. (Series: Its Trudy, vyp. 81)  
Errata slip inserted. 1,200 copies printed.

Sponsoring Agency: Glavnoye upravleniye gidrometeorologicheskoy sluzhby  
pri Sovete Ministrov SSSR.

Ed. (Title page): M. I. Yudin, Doctor of Physical and Mathematical Sciences  
and M. Ye. Shvets, Doctor of Physical and Mathematical Sciences; Ed.  
(inside book): L. P. Zhdanova; Tech. Ed.: O. G. Vladimirov.

PURPOSE: This issue of the Geophysical Institute's Transactions is intended for  
scientific workers and specialists in dynamic and synoptic meteorology.

COVERAGE: This collection of articles treats problems in dynamic meteorology.  
The articles, for the most part, discuss computation methods of forecasting  
meteorologic elements. Closely related to this is a study aimed at determining

Card 1/2 2

3(7)

AUTHOR:

Yudin, M. I.

SOV/50-59-1-18/20

TITLE:

The International Symposium on Atmospheric Diffusion and Contamination of the Air (Mezhdunarodnyy simpozium po atmosfernoj diffuzii i zagryazneniyu vozdukha)

PERIODICAL:

Meteorologiya i gidrologiya, 1959, Nr 1, pp 67-69 (USSR)

ABSTRACT:

The author reports on the meeting held in Oxford on August 24-29, 1958. The Soviet delegation included: A. M. Obukhov (Corresponding Member, AS USSR, and Head of the delegation) and the Professors A. S. Monin and M. I. Yudin. The Soviet lectures were: A. S. Monin: A general survey of the investigations on the theory of atmospheric diffusion. A. M. Obukhov: The description of turbulence in Lagrange's (Lagrangh) variables. M. I. Yudin: The diffusion of heavy particles. A. S. Monin: The spreading of smoke in the ground layer of the atmosphere.

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SOV/56-59-2-14/25

3(7)

AUTHOR:

Yudin, M. I.

TITLE:

On the Development of Physical Foundations for Numerical Short-term Forecasts (O putyakh razvitiya fizicheskikh osnov chislennogo kratkosrochnogo prognoza)

PERIODICAL:

Meteorologiya i gidrologiya, 1959, Nr 2, pp 46 - 51 (USSR)

ABSTRACT:

The present stage of investigations in the field of dynamic meteorology is characterized by efforts to solve the problem of numerical weather forecasts. The article under review raises a number of basic outstanding questions and adds some reflections on possible ways of tackling the problem. The method most thoroughly developed and tested is that of forecasting the geopotential on a medium altitude. However, the important question of the range of influence of the eddy-advection on the changes in the geopotential has so far remained unsolved. In a more detailed consideration of the integral equation for the continuity (Ref 6) Poisson's equation is replaced by the Helmholtz equation (see formula (1)). It is shown that on account of the very small value represented

Card 1/4

On the Development of Physical Foundations for Numerical Short-term Forecasts SOV/50-59-2-14/25

by the corrective term the two equations must be practically equivalent, which means that in the case of great distances ( $r > 2.5 \cdot 10^3$  km) the eddy advection does not affect the geopotential changes at the point in question. This is actually the case in the atmosphere, insofar as the eddy advection on the isobaric area changes its mathematical signs a number of times. It is shown that the contributions of areas with positive and negative eddy advectons compensate each other over great distances (interference effect) and that geopotential changes practically depend on the character of the pressure distribution in the vicinity of the point in question. This concept is confirmed by synoptic experience. At the same time, however, the considerations quoted in this article show that the results of calculations may be distorted considerably (as a consequence of the gradual convergency of the integral (3)) if artificial boundaries are given even at a great distance from the point at which the geopotential change is to be determined. Other possible ways were pointed out by other authors. It was also said in this connection that in the practical testing of "barocline" models the fore-

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On the Development of Physical Foundations for Numerical SOV/50-59-2-14/25  
Short-term Forecasts

cast on the medium altitude was not any better than in the case of the "barotropic model". In view of the reflections voiced in this article it was decided not to use the nearest points in the triangular network ( $r \approx 330$  km) but those on the following circular circumference ( $r \approx 570$  km) when drafting a forecast pattern for a model with two altitudes (500 mb and 850 mb) at the Glavnaya geofizicheskaya observatoriya (Main Geophysical Observatory) in the calculation of the Laplacian of the geopotential at point 0. The results for 1957 are given. Mention is made of the various suggestions for the clarification of the physical contents of the theory of non-stationary processes in the atmosphere. In this connection the method, suggested by the author in the paper (Ref 11), for forecasting the wind field, temperature, and vertical currents is given. This method is then studied from the angle of an exact consideration of the quantities not dependent on the non-geostrophic behaviour of the wind. A number of outstanding questions raised in the application of the theory of these processes

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On the Development of Physical Foundations for Numerical SOV/50-59-2-14/25  
Short-term Forecasts

to numerical forecasting are mentioned. The main short-coming of all application tests of the numerical forecasting method carried out so far has been the fact that the initial material is incommensurable. Moreover, a detailed analysis of the results would be also required. There are 2 figures, 1 table, and 16 references, 11 of which are Soviet.

Card 4/4





3.9000  
~~3(7), 1(12)~~  
AUTHORS:

Zavarina, M. V., Yudin, M. I.

67175  
S/050/60/000/02/001/016  
B007/B005

TITLE:

Accurate Definition and Use of the Richardson Number for the Identification of the Bump Zones of Aircraft

PERIODICAL:

Meteorologiya i gidrologiya, 1960, Nr 2, pp 3-10 (USSR)

ABSTRACT:

A physical interpretation of the Richardson number is given first, and it is pointed out that in recent years it has been widely used for forecasting the bump zones of aircraft (Refs 6,7,8). If  $Ri$  is less than unity, it may be regarded as an indicator for the level of turbulent energy (Ref 10). If it is assumed that the aircraft bump occurs at a very highly developed turbulence, a  $Ri$  number considerably less than unity must be the necessary condition for the origin of turbulence. In calculating  $Ri$  in zones of increased turbulence causing the bump, some authors obtained  $Ri < 1$  (Refs 12,14) and others  $Ri > 1$  (Refs 2,8). The present paper has the purpose of clarifying this apparent contradiction. The causes of this contradiction are as follows: 1) In a number of cases, the Richardson number is not determined for the atmospheric layers where the aircraft bump was observed. 2) In calculating  $Ri$  by aerological data, ✓

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Accurate Definition and Use of the Richardson Number for the Identification of the Bump Zones of Aircraft

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the derivatives in formula (2) for the energy transformation are replaced by finite differences. Here, the authors average these differences by layers of different thickness - from some hundreds of meters up to some kilometers. Formula (11) is derived. It expresses the relation between the Ri number and the averaging thickness L. This formula shows that it is possible to obtain  $Ri < 1$  and  $Ri > 1$  for the same turbulent state of the atmosphere.  $Ri < 1$  is obtained in the case of a small averaging scale.  $Ri > 1$  is obtained at an averaging scale exceeding a certain value of  $L_{max}$  (maximum scale of turbulence). 3) In

calculating the Richardson numbers, an important source of turbulent energy - heat of condensation - has not been considered up to date. In investigating the cloud layers, it is necessary to renounce the adiabatic course of processes, and introduce the moist-adiabatic lapse rate  $\gamma_m$  instead of the dry-adiabatic lapse rate  $\gamma_d$ . These 3 points should be considered in the calculations. Thus, the authors attained a high probability factor in determining the aircraft bump zone. The evaluation was carried out by means of the probability coef- ✓

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Accurate Definition and Use of the Richardson  
Number for the Identification of the Bump Zones  
of Aircraft

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efficient  $Q$  suggested by A. M. Obukhov (Ref 5): Formula (14).  
Figure 1 shows a diagram which was drawn on the basis of air-  
craft- and radio-balloon observations made in Minsk for 2 years  
(in April). It shows that the Richardson number can be used  
to determine the possibility of bump development. It is pointed  
out that  $Ri$  is mainly used to determine the turbulent state of  
the atmosphere. The idea that a bump only develops under the  
influence of turbulence is not quite exact. The wave motions on  
the interface may also be the cause of the bump. There are  
1 figure and 15 references, 11 of which are Soviet. 4

Card 3/3

BUDYKO, M.I.; YUDIN, M.I.

Level fluctuations in landlocked lakes. Meteor. i gidrol. no.8:  
15-19 Ag '60. (MIRA 13'8)

(Lakes)

YUDIN, M.I.

Development of numerical short-range forecasting on a physical  
basis. *Nek. probl. meteor.* no. 1:24-26 '60. (MIRA 13:8)  
(Weather forecasting)

S/050/60/000/007/003/004/XX  
B012/B063

AUTHOR: Yudin, M. I.

TITLE: Synoptic Material for the Testing of Numerical Forecasting Methods ✓

PERIODICAL: Meteorologiya i gidrologiya, 1960, No. 7, pp. 22 - 25

TEXT: In order to determine the advantages and disadvantages of various methods of numerical forecasting, the following recommendations were made by the Vsesoyuznoye soveshchaniye po teorii izmeneniya davleniya i protsessam tsiklo- i antitsiklogeneza (All-Union Conference on the Theory of Pressure Changes and on Processes of Cyclo- and Anticyclo- genesis) ✓: Such methods should be compared on the basis of the same material including the initial data. In order to prepare testing material, a team of experts was established at the sektsiya sinopticheskoy meteorologii i aerologii Nauchno-tekhnicheskogo soveta GUGMS (Section of Synoptic Meteorology and Aerology of the Scientific and Technical Council of GUGMS). This team included the following scientists:  
A. M. Obukhov, Corresponding Member of the AS USSR, the Doctors of

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Synoptic Material for the Testing of Numerical Forecasting Methods S/050/60/000/007/003/004/XX  
B012/B063

Sciences I. V. But, A. F. Dyubyuk, A. S. Zverev, B. D. Uspenskiy,  
M. I. Yudin, (Chairman), the Candidates of Sciences Ye. P. Borisenkov,  
P. K. Dushkin, S. A. Mashkovich, and A. D. Chistyakov. The present paper  
gives the proposals made by the team and approved by the above-mentioned  
section. These proposals deal with the performance of tests. Regarding  
the comparison of various methods, the team restricted itself to the  
smallest region, i.e., the European part of the Soviet Union. Since  
electronic computers were not always available, three variants of tests  
were worked out: 1) a variant comprising 16 cases; 2) a variant com-  
prising 32 cases including the first 16; 3) a variant comprising 64  
cases including the 32 cases of the first and second variants. The fact  
that the least number of samples is sufficient for eliminating bad fore-  
casts was taken into account. The fundamental condition required that  
even the smallest sample contains a sufficiently large number of dif-  
ferent synoptic processes based on the characteristics of baric forma-  
tions on the earth surface and on the results of analyses of upper-air  
maps. The sampling was carried out only on the strength of data of the  
last few years with special regard to the International Geophysical  
Year. All cases which could not be clearly interpreted were not

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Synoptic Material for the Testing of  
Numerical Forecasting Methods

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B012/B063

considered. The variability of synoptic processes in one sample was checked according to data furnished by G. Ya. Vangengevm and E. A. Isayev. Besides, the particular features of atmospheric processes occurring in 1957 and 1958 were studied by the raschetnyye gruppy Severo-Zapadnogo byuro pogody (Calculating Teams of the Northwest Weather Bureau) and the Akademiya im. A. F. Mozhayakogo (Academy imeni A. F. Mozhayskiy). The preliminary selection of the cases was carried out by N. I. Bel'skiy, Ye. P. Borisenkov, I. V. But, A. S. Zverev, E. A. Isayev, A. A. Morozkin, L. S. Orlova, A. D. Chistyakov, and others. The dates of the 64 cases are listed in Table 1. The accuracy of forecasts of the geopotential field is determined from the relative error, i.e., the ratio of the mean absolute error,  $|\overline{\epsilon H}|$ , of forecast to the mean absolute actual change,  $|\overline{\delta H}|$ , of the geopotential in the same area. In many cases, the root-mean-square errors of forecasts and actual changes were calculated instead of the mean absolute values, after which the ratio was determined. Experience has shown that the relative errors determined by the two methods agree up to 0.02-0.05. It is shown that the correlation factor cannot be regarded as the principal characteristic for the accuracy of forecasts. For an exact study

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Synoptic Material for the Testing of  
Numerical Forecasting Methods

S/050/60/000/007/003/004/XX  
B012/B063

of error sources it is, however, very useful to calculate the correlation factor. It is noted that the mean relative error of forecasts is the proper characteristic for the accuracy of forecasts of the absolute geopotential and the pressure on the sea-level, as well as for forecasts of the relative geopotential and air temperature. Since the accuracy of a forecast cannot be exactly determined from the mean relative error, it is necessary to take into account the ratio of the root-mean-square error in the determination of the geostrophic wind to the root-mean-square value of the wind. The team believes that the problem concerning the best characteristics for the accuracy of forecasts has not been fully solved as yet, and, therefore, it recommends further investigations. In particular, it recommends the exchange of testing material among the organizations concerned. There is 1 table.

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YUDIN, M. I., KOBYAKOVA, A. A.

Forecasting the  $H_{500}$  and  $H_{850}$  pressure fields by the use of the  
"Strela-3" electronic calculating machine. Trudy TSIP no. 106:3-10  
'60. (MIRA 1):1, 2,

(Atmospheric pressure)  
(Electronic calculating machines)

YUDIN, M. I.

Selecting the network of control points in numerical forecasting  
of meteorological fields. Trudy GGO no. 114:66-74 '60.

(MIRA 14:2)

(Weather forecasting)

YUDIN, M.I., doktor fiz.-mat. nauk, prof., red.; VLASOVA, Yu.V., red.;  
BRAYNINA, M.I., tekhn. red.

[Materials of the Conference of the Coordinating Commission on  
Numerical Forecast Methods] Materialy soveshchaniia. Pod red.  
M.I. Iudina. Leningrad, Gidrometeor. izd-vo, 1961. 133 p.  
(MIRA 14:8)

1. Russia(1923- U.S.S.R.) Koordinatsionnaya komissiya po  
chislennym metodam prognoza.

(Meteorology)

41166  
S/159/62/000/009/080/120  
D228/D307

3,5000

AUTHOR: Yudin, M. I.

TITLE: Correlations of the elements of large-scale atmospheric movements and certain forecasting consequences

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 9, 1962, 34-35, abstract 9B206 (In collection: Materialy Soveshchaniya Koordinats. komis. po chisl. metodam prognoza, gidrometeoizdat, 1961, 5-24)

TEXT: I. A. Kibel' (1940) was the first to estimate the items in atmospheric dynamics equations. For this purpose he applied scale analysis, verging on methods of the similarity theory. This analysis did not take into account changes in the meteorologic elements, which determine the serial order of the equations' terms. In a number of cases, however, the characteristic significance of a meteorologic element's derivative is governed by its systematic change in space and is almost independent of the scale of movement when the latter varies widely. In this case the similarity theory's

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Correlations of the ...

formal application for determining the significance of various items in the thermodynamic equation system in order to forecast meteorologic elements in the atmosphere is incorrect and can lead to imprecise deductions. The allowance for systematic changes in the meteorologic elements is, from this viewpoint, substantial enough. Since the scale of movement concept is quite definite only for "one-scale" movements, its extension to the case of actual multiscale atmospheric movements involves the elimination from their total aggregate of a narrow spectral section -- i.e. of the spectral analysis of velocity, density, and pressure fields. If no such analysis is made, the concept of the scale of movement, which is most fundamental in the theory of similarity, does not appear to be quite clear, and the conclusions resulting from considerations of the similarity are deprived of their definiteness. The most expedient way of investigating the set problem is to analyze spectrally the meteorologic fields and substitute the corresponding expressions in the atmospheric dynamics equations. For this it is suggested that a linearized system of equations should be examined in order to avoid cumbersome nonlinear equations. This linearization

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D228/D307

is made with respect to the main movement, which for large-scale atmospheric processes may be taken as a stationary zonal motion caused by the temperature's systematic variation with latitude. Here the characteristic values of the items of the linearized equation system are close to those of the corresponding terms of the original nonlinear equation system. The application of scale analysis to the linearized system of thermohydrodynamics equations and the spectral analysis of the meteorologic fields result in the following new deduction: however small the divergence of the horizontal amount of movement in the atmosphere, it is, nevertheless, one of the factors determining the character of atmospheric processes. It hence follows that models of the atmosphere, in which horizontal divergence is disregarded throughout the atmosphere (the so-called "quasisolenoidal" atmospheric models), cannot correctly reflect large-scale movements and, in particular, the spectrum's global section. Thus, for example, disregarding horizontal divergence when forecasting at the atmosphere's average level results in seriously exaggerated velocities of global wave propagation, as was discovered, too, in operative forecasting practice in

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Correlations of the ...

the USA. It is also shown that, of the amplitudes and phases of pressure waves vary little with altitude in a certain spectral area, the conditions of existence of slow global movements are disturbed. This, in its turn, involves the appearance of rapid waves and the abrupt reorganization of meteorologic fields to a state where they definitely conform to the criteria of the existence of slow global movements. Such a conclusion is confirmed in the empirical rule (established by T. A. Duletova, 1956), which indicates that in a number of cases "rectifications of the axes" of baric formations are observed over much of the northern hemisphere before the intense reorganization of meteorologic fields and the evolution of new cycles. [Abstracter's note: Complete translation.]

Card 4/4

YUDIN, M.I.

Some structural regularities of the field of the geopotential.  
Trudy GGO no.121:3-18 '61. (MIRA 15:5)  
(Meteorology)

ACCESSION NR: AT4016871

S/2531/63/000/143/0036/0050

AUTHOR: Yudin, M.I.

TITLE: Solution of equations of dynamics of the atmosphere using patterns of structure of meteorological fields for purposes of short-range weather forecasting

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy\*, no. 143, 1963, Voprosy\* chislennogo prognoza i struktura meteorologicheskikh poley (Problems in numerical forecasting and structure of meteorological fields), 36-50

TOPIC TAGS: meteorology, atmospheric temperature field, atmospheric pressure field, dynamic meteorology, short-range weather forecasting, weather forecasting, meteorological field, numerical forecasting, ageostrophic model, wind, geostrophic wind

ABSTRACT: Due to the development of work on the use of an ageostrophic model in numerical weather forecasting it is deemed desirable to publish the original work on this method; the work was done in 1951-1952. The author derives equations for the model and presents a solution of the three-dimensional problem of changes of meteorological elements by the ray method. The manuscript, twelve years old, has not been revised and there is no indication of whether individual formulas and conclusions remain valid. The first part of the paper gives the derivation of equations making it possible to determine deflections of

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ACCESSION NR: AT4016871

the wind from the geostrophic wind in the case of large-scale movements when the spatial distribution of pressure and temperature is known. The formulas cited can be used for determining the direction and movement of a pressure center relative to air particles. Similar formulas can be derived for the rates of movement of troughs, ridges and other elements of the pressure and thermal field. The key formula cited can be adapted to many problems in forecasting; solution of the equation is given. Orig. art. has: 42 equations and 2 figures.

ASSOCIATION: Glavnaya geofizicheskaya observatoriya (Main Geophysical Observatory)

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DATE ACQ: 20Feb64

ENCL: 00

SUB CODE: AS

NO REF SOV: 005

OTHER: 000

Card 2/2

OBUKHOV, A.M., red.; YUDIN, M.I., doktor fiz.-matem. nauk, red.;  
YASNOGORODSKAYA, M.M., red.; BRAYNINA, M.I., tekhn. red.

[Transactions of the All-Union Scientific Meteorological  
Conference] Trudy Vsesoyuznogo nauchnogo meteorologicheskogo  
soveshchaniya, 1961. Leningrad, Gidrometeoizdat. Vol.2.  
[Dynamic meteorology] Dinamicheskaya meteorologiya. Pod red.  
A.M.Obukhova i M.I.Yudina. 1963. 241 p. (MIRA 16:7)

1. Vsesoyuznoye nauchnoye meteorologicheskoye soveshchaniye,  
1961. 2. Chlen-korrespondent AN SSSR (for Obukhov). 3. Glav-  
naya geofizicheskaya observatoriya (for Yudin).  
(Meteorology)

ACQUISITION OF INFORMATION  
ACQUISITION OF INFORMATION

Zavarina, Mariya Vasil'yevna, 1919, M. S. U. S. S. R.

Calculating machines and their use in meteorology  
type machine with tape reader and printer  
Leningrad, hydrometeorological institute  
students of hydrometeorological institute

PHYSICAL: computer, computer, program, data

PURPOSE AND SCOPE: This book is devoted to the  
of mechanization and automation of calculations  
meteorological work and with the use of special  
the calculation of various meteorological  
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the calculation of various meteorological

TOP SECRET

SECRET

CONFIDENTIAL

SECRET

1. The purpose of this report is to provide

information on the activities of the

organization in the area of

intelligence gathering and analysis.

2. The organization has been active in

the area of intelligence gathering and

analysis for several years.

3. The organization

has been active in the area of

intelligence gathering and analysis.

4. The organization

has been active in the area of

intelligence gathering and

analysis.

Card 2

ACCESSION NUMBER 4046925

DATE OF DEPOSIT 15 DECEMBER 1973

100-73



PHASE I BOOK EXPLOITATION

SOV/6482

Yudin, Mikhail Isaakovich

Novyye metody i problemy kratkosrochnogo prognoza pogody (New Methods and Problems in Short-Range Weather Forecasting) Leningrad, Gidrometeoizdat, 1963. 403 p. Errata slip inserted. 3000 copies printed.

Resp. Ed.: S.I.Titov; Ed.: Yu.V.Vlasova; Tech. Ed.: M.I. Braynina.

PURPOSE: The book is intended for meteorologists engaged in theoretical research or practical weather forecasting, as well as for advanced students in meteorology and specialists in related branches of science. Emphasis is on the techniques of modern dynamic meteorology.

COVERAGE: This monograph provides a general review of the present status of studies in the field of short-range numerical weather

Card 1/2

New Methods and Problems (Cont.)

SOV/6482

forecasting, especially on the rapid development of forecasting methods and their routine use. Emphasis is placed on the formulation of problems and the logical and physical basis for the ideas underlying the theory of large-scale atmospheric movements and methods for their prediction. The statistical properties of atmospheric movements, which must be known for the evaluation of various forecasting models, also are emphasized. Sources of errors in numerical forecasting and means for eliminating them are discussed in detail. A special chapter deals with the objective analysis of meteorological data by use of electronic computers. Certain aspects of numerical forecasting have not been discussed in the book; the author mentions that three major special problems should be treated in separate books: (1) long-range hydrodynamic forecasts; (2) numerical forecasting of meteorological elements in the boundary layer of the atmosphere; and (3) statistical methods of forecasting. The author thanks A.M. Obukhov, S.A. Mashkovich, S.I. Titov, A.S. Monin, A.M. Yaglom, L.S. Gandin, A.S. Dubov, K.V. Fyatygina, and M.Ye. Shvets. There are 277 references, 189 of which are Soviet.

Card 2/6

YUDIN, M.I.

"How to find optimal parameters in a numerical scheme of weather forecasting."

Report submitted to the Intl. Symposium on Numerical Weather Prediction  
Oslo, Norway 11-16 March 1963

YUDIN, M.I.

A.A. Fridman and his works in the field of meteorology. Izv.  
AN SSSR. Ser. geofiz. no.7:1086-1099 J1 '63. (MIRA 16:8)

(Fridman, Aleksandr Aleksandrovich, 1888-1925)