S/169/61/000/010/007/053
D228/D304

AUTHORS: Nersesov, I. L., and Khalturin, V. I.

TITLE: The Karatega earthquake of January 7, 1958

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 10, 1961, 10, abstract 10A118 (Tr. In-ta seysmostoyk. str-va i seysmol. AN TadzhSSR, 7, 1960, 87-96)

TEXT: Instrumental and macroseismic data are stated concerning the six-mark earthquake which occurred in the Garmo district of the Tadzhik SSR. [Abstracter's note: Complete translation.]

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S/519/60/000/008/003/031
D051/D113

AUTHORS: Riznichenko, Yu.V.; Nersesov, I.L.

TITLE: Contribution to the development of the principles of a quantitative method of seismic zoning

SOURCE: Akademiya nauk SSSR. Sovet po seysmologii. Byulleten', no. 8, Moscow, 1960. Voprosy seysmicheskogo rayonirovaniya, 36-59

TEXT: The authors discuss the basic features of a quantitative method of close seismic zoning, which was developed by the Tadzhikskaya kompleksnaya seysmologicheskaya ekspeditsiya (Tadzhik Large-Scale Seismological Expedition) (TKSE) of the Institut fiziki Zemli AN SSSR (Institute of Physics of the Earth of the AS USSR) and the Institut seysmologii AN Tadzhikskoy SSR (Institute of Seismology of the AS Tadzhikskaya SSR). On the basis of data obtained by observations from 1955 to 1957 in the Garmskiy and Stalinabadskiy rayons, a map of seismic activity of these territories was plotted, which permits calculating the mean times of recurrence of earthquakes of different intensity in individual areas. The quantitative method of close seismic zoning, whose development is still in the initial stages, is intended to fill a gap

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in present Soviet seismic research, in which the methods of general zoning (on a 1:5.000,000 scale) and microzoning (1:100,000) are mainly used. Quantitative close seismic zoning, which is carried out on a 1:500,000 scale, is an attempt to combine comprehensive seismic and geophysical research, so as to entirely satisfy the needs of earthquake engineering. Basic features of the new method are the quantitative characterization of earthquake intensity by frequency spectra and large-scale consideration of microearthquakes, in order to extrapolate strong ones. Discussing the method in detail, the authors first present some basic results obtained through the study of frequency spectra and the fading of vibrations with increasing distance from the earthquake center, i.e. dynamic characteristics of earthquakes; propagation of seismic waves depending on geological structure. They consider that the best quantitative method of representing seismicity is using earthquake recurrence N and seismic activity A as characterizing quantities. N is the usual ordinate of earthquake recurrence graphs (in regard to the surface of a region or the volume of a space it is called "normalized") and A designates the "level" of seismicity in these graphs. A graph, for instance, showing, depending on earthquake intensity, different earthquake recurrence curves for

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various areas will, consequently, for a given earthquake intensity present different earthquake recurrence levels of these areas. The unit of A (A can be indexed A_1, A_2, etc., according to the seismic intensity $E = 10^{1,2,\ldots}$ joules) corresponds to the annual recurrence of one earthquake on an area of 100 km. Rendering of the activity in A_7 units proved useful to the TKSE, which, with a dense network of stations, worked on limited territories of high seismicity. Another important characterizing quantity is $\gamma = -\frac{\Delta \log N}{\Delta \log E}$ (E - earthquake intensity), which is constant for rectilinear recurrence curves, i.e. for curves depending on seismic intensities up to 10^{16} or 10^{17} joules. The knowledge of the law of earthquake recurrence $N = N(E)$ for a given district, permits calculating the mean density of the energy flow of all earthquake centers in this region. In this connection, the authors derived some formulae for W (energy flow) and ε (tectonic movement), which, however, due to the insufficient knowledge of N(E) regularities are only relatively important. Turning to the mapping of seismic acti-

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ity, the authors give a detailed account of how to determine the density of epicenters of a region in units of seismic activity and how to establish the seismic activity of the area according to the epicenters of earthquakes of various intensity. The concluding part of the article contains information on plotting and on an analysis of the initially mentioned map of seismic activity in two Tadzhik rayons. The following Soviet scientists are mentioned in connection with seismic research: A.G. Nazarov, S.V. Medvedev, V.I. Bune, Ye.F. Savarenskiy, G.A. Gamburtsev, and E.A. Dzhibladze. There are 8 figures and 36 references: 18 Soviet and 18 non-Soviet-bloc references. The four most recent references to English-language publications read as follows: B. Gutenberg, C.F. Richter, Magnitude and energy of earthquakes, Nature, 176, no. 4486, 1955; P.S. Amand, Two proposed measures of seismicity, Bull. Seism. Soc. Am., 46, no. 1, 1956; C. Tsuboi, Energy account of earthquakes in and near Japan. Journ. Phys. Earth., 5, no. 1, 1957; J.V. Riznichenko, On quantitative determination and mapping of seismic activity, Annali di Geofisica, Roma, v. XII, no. 2, 1959.

ASSOCIATION: Institut fiziki Zemli AN SSSR (Institute of Physics of the Earth of the AS USSR)

Card 4/4

S/519/60/000/008/019/031
D051/D113

AUTHORS: Bune, V.I.; Nersesov, I.L.

TITLE: Some results of a study of the seismicity of the Stalinabadskiy rayon

SOURCE: Akademiya nauk SSSR. Sovet po seysmologii. Byulleten', no. 8, Moscow, 1960. Voprosy seysmicheskogo rayonirovaniya, 157-165

TEXT: A report on an investigation of the seismicity of the Stalinabadskiy rayon is given. The investigation was carried out from 1955 to 1957 by the Stalinabad section of the Tadzhikskaya kompleksnaya seysmologicheskaya ekspeditsiya (Tadzhik Comprehensive Seismological Expedition) (TKSE). This expedition was organized in 1954 under the guidance of G.A. Gamburtsev. Using a network of seismic stations, the section recorded about 300 micro-earthquakes (energy 10^6 - 10^9 joules) without taking into account the recurrent shocks of the Nurek earthquake of September 22, 1956; for comparison, the authors state that only about 150 earthquakes were recorded in the years 1907-54. The results of the observations are shown on maps of epicenters and seismicity, both included in the article. The latter was compiled by

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the authors together with Yu.V. Riznichenko, who proposed and described the method of compiling maps of this type in two publications. The maps permit two basic epicentral areas in the Stalinabadskiy rayon to be distinguished: (1) The Gissar (northern) zone which lies along the southern slopes of the Gissar Mountains and (2) the southern zone which lies along the southern slope of the Gissar Valley. Both areas are distinctly confined to the faults which bound the Gissar Valley from the south and north. The focus depths of these zones vary from 5 to 30 km. The central part of the valley has only a limited number of epicenters and divides the epicentral zones; on the basis of geological and strong earthquake data, these zones were also distinguished by I.Ye. Gubin and L.B. Vasil'yeva. The distribution of earthquake centers determined according to instrumental observations over the past 27 years basically confirms the existence of two seismic zones. Their activity is characterized by local variations so that they constitute unusual mosaics of seismically active sections. Another feature is the occurrence of stronger earthquakes in regions of reduced seismicity or of microearthquake epicenter accumulation; this phenomenon, however, still needs further study so that a regular correlation between micro- and strong earthquakes can be es-

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tablished. The rest of the article is devoted to problems of earthquake recurrence in the Stalinabadskiy rayon. As can be seen from two graphs, the recurrence curve plotted according to strong and microearthquake data of different observation periods of various duration, essentially coincides in linearity and direction with the curve representing earthquake recurrence, exclusively on the basis of data obtained from 1955 to 1956. This shows that data on microearthquakes can be used for judging the seismic activity of a given territory. The earthquake recurrence for the northern and southern zones is also graphically illustrated. The problem of the possible maximum earthquake intensity for a given seismic zone could not yet be resolved. Seismologists S.A. Zakharov and V.A. Nechayev are mentioned in the article. There are 6 figures and 12 Soviet references.

ASSOCIATION: Institut seysmologii AN Tadzh. SSR (Institute of Seismology of the AS Tadzhikskaya SSR), Institut fiziki Zemli AN SSSR (Institute of Physics of the Earth of the AS USSR)

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R001136620(

NERSESOV, I.L.

S/169/61/000/010/009/053
D228/D304

AUTHORS: Bune, V. I., Gzovskiy, M. V., Zapol'skiy, K. K., Keylis-Borok, V. I., Krestnikov, V. N., Malinovskaya, L. N., Nersesov, I. L., Pavlova, G. I., Rautian, T. G., Reysner, G. I., Riznichenko, Yu. V., and Khalturin, V. I.

TITLE: Methods of the detailed study of seismicity

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 10, 1961, 12-13, abstract 10A144 (Tr. In-ta fiz. Zemli AN SSSR, no. 9, 1960, 327 p.)

TEXT: The Tadzhik complex seismologic expedition was organized with the aim of studying the nature of earthquakes and the conditions of their genesis. The most seismically-active zones of the USSR (Garmo and Stalinabad) were chosen as the work areas. The specific conditions of working and processing the data demanded the development of special systems of observation and methods of interpretation. The large amount of recorded

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seismic phenomena permitted the use of statistical methods for studying their distribution in space and time; these methods, in their turn, provided the basis for introducing the quantitative indices of the seismicity characteristics of the seismically-active areas. The actual seismic observations were closely coordinated with geologic investigations, and this provided the possibility of exposing the tectonic basis of the seismic phenomena. A general review of the work area is given in Chapter 1, and concise data on major earthquakes are cited together with the general position of the expedition stations. A description of the standard main and auxiliary apparatus used at the stations, and also the layout and description of newly developed equipment--including an automatic seismic station with a magnetic memory--is cited in Chapter 2. The methods developed and utilized in the expedition for studying the crust's structure in the area under investigation from the records of nearby earthquakes are described in Chapter 3. Horizontal and vertical hodographs were constructed. The resulting material enabled the crust to be represented as a one-layer mass

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with a longitudinal-wave velocity of 6.0 - 6.1 km/sec. At the Mohorovicic boundary, the velocity suddenly changes to 8.0 km/sec. and then somewhat decreases, but at a depth of 300 km it subsequently increases to 9.2 km/sec. These data underlay the construction of isochrone charts used to localize the epicenters and to determine the focal depths. The isochrone charts were constructed with an account of the heterogeneity of the work area's geologic structure and the peculiarity of the seismic stations' location. This enabled the precision of hypocenter localization to be substantially increased, reducing it to 1 - 2 km at the center of the work area's topographic map. In Chapter 4, the definition of the concept of seismic energy at the focus is given, and the basic formulas are derived for its calculation. On the basis of experimentally obtained laws for the dying out of energy with distance, nomographs were constructed to determine practically the energy at the focus from the records of nearby earthquakes. Appraisal of the precision of calculation of the energy in relation to different factors shows that it may be determined accurately to the order of its magnitude. In this connection, the value K = lg E j.

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is introduced for characterizing the energy class of earthquakes. The value of K is compared with the earthquake magnitude M. The study of the iso-energy lines shows that the different degrees of the dying out of seismic energy along and across the strike of geologic structures exert a decisive influence on the form of the isoseisms. In Chapter 5, the frequencies of seismic vibrations are studied--in relation to the earthquake energy, the distance from the source, the geologic conditions at the point of observation and at the hypocenter, etc.--from recordings at both the customary stations and a special ЧИСС (ChISS) seismic-station intended for frequency analysis of seismic waves directly at their place of registration. A detailed description is given for the frequency-selective seismic-station ЧИСС-1954 (ChISS-1954) and for the results of the investigation of its recordings. Certain epicentral zones with an anomalous frequency are thereby revealed. The procedure for theoretically calculating the focal characteristics, and also for appraising these latter from empirical data, is given in Chapter 6. Several formulas are cited for determining the size of a focus in relation to its energy on the basis of different physical propositions. The dynamic parameters of the foci are determined; there appear to be definite predominant directions for both the strike and dip of the fracture planes. The characteristics of the seismic conditions of the Garmo and Stalinabad seismically-active regions--both as a whole and in individual areas--are quoted together with the variations in the parameters of the conditions in time. The quantitative expression of the seismicity during constant seismic conditions is determined by the seismic activity. The possibility is shown of constructing graphs of the recurrence of earthquakes from short observations of weak shocks, and methods are given for determining the period required to obtain the parameters of the seismic conditions with a pre-set precision in relation to the energy of the recorded earthquakes. The statistical constancy of the seismic conditions is determined by the so-called measure of dispersion of the frequency of earthquakes. A brief description of the area's stratigraphy and the history of its geologic development is given in Chapter 8. The structural schemes and descriptions of the most important

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deep faults are cited. The contemporary structure of the Garmo area is depicted as two main regions: the alpine geosynclinal zone in the south and the activated epi-Hercynian platform in the north. In section, it is drawn as several steps of Paleozoic basement adjoining each other along deep faults. A comparison of the seismicity with the tectonics of the study areas is made in Chapter 9. The construction of maps of isolines of seismic activity and gradients of the rate of tectonic movements is recommended for appraising the connection between the seismicity and the tectonics. Methods are cited for constructing such maps. The congruence between these magnitudes is established for the regions under investigation, and areas with the maximum gradient values correspond to those with the highest values of seismic activity. 272 references. [Abstracter's note: Complete translation.]

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BUTOVSKAYA, Ye.M.; KON'KOV, A.T.; NERSESOV, I.L.; PAK, V.A.; TROSTYANSKIY, G.D.; ULOMOV, V.I.; SOKOLOVA, A.A., red.; GOR'KOVAYA, Z.I., tekhn.red.

[Seismism of Uzbekistan] Seismichnost' Uzbekistana. Tashkent, Izd-vo Akad.nauk Uzbekskoi SSR. Vol.1. [The Fergana Valley] Ferganskaia dolina. 1961. 97 p. (MIRA 15:5)

1. Akademiya nauk Uzbekskoy SSR. Institut matematiki. (Fergana—Seismology)

BAGDASAROVA, A.M.; ISLAMOV, K.Sh.; KORIDALIN, Ye.A.; KUZNETSOV, V.P.; KUZ'MINA, N.V.; NENILINA, V.S.; NERSESOV, I.L.; SULTANOVA, Z.Z.; KHARIN, D.A.

Seismicity of the eastern part of the southern spurs of the Greater Caucasus and some problems of methodology in studying the seismicity of individual regions. Report No.3. Izv.AN Azerb.SSR. Ser.geol.-geog.nauk i nefti. no.4:13-24 '61. (MIRA 15:1)
(Caucasus--Seismology)

NERSESOV, I.L.

S/619/61/000/017/001/002
D239/D302

AUTHORS: Medvedev, S.V., Bune, V.I., Vvedenskaya, N.A., Gayskiy, V.N. Kirillova, I.V., Nersesov, I.L., Riznichenko, Yu.V., Savarenskiy, E.F. and Sorskiy, A.A.

TITLE: Instructions for regional seismological summaries

SOURCE: Akademiya nauk SSSR. Institut fiziki Zemli. Trudy no. 17 (184) Moscow 1961. Voprosy inzhenernoy seysmologii no. 5, 128-145

TEXT: These instructions were confirmed by the director of the Institute of Geophysics AN SSSR, M.A. Sadovskiy, on February 27, 1961. Their objective is clearly to secure a uniform system of recording all seismological data pertinent to building construction, obtained in future in the USSR. The instructions are divided into six parts, containing 64 numbered articles, the following being an indication of the scope of each part: 1) General

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Section. This defines the purpose and scope of the work. The seismological map of the USSR established in 1957 is being kept up to date by continuing observations. Its scale is 1 : 5.000,000. The map is to be used to make seismological forecasts both for the epicentral zone and for the whole earth's surface. 2) Instrumental data on earthquakes. This is defined as data obtained now from both fixed and expeditionary stations as opposed to the study of past earthquakes. Methods of classification by magnitude, precision of epicentral location and frequency of recurrence are defined. 3) Engineering seismology. Under this heading is defined the format of an atlas of strong earthquake with isoseismals. This should be on a scale of 1: 1,000,000. It is also hoped to include data on the energy density distribution of the frequency spectra. 4) Seismogeological data. Since some regularity is discernible in the distribution of shocks, a "seismotektonic" map should be a possibility. This would be particularly helpful in regions where seismological data up to this time are

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sparse. Gravitational data could also be useful here. 5) Procedures for making seismological summary maps and their documentation. These are to be of two types, corresponding to 1 and 3, above, i.e. seismological maps and maps of isoseismals showing energy and attenuation characteristics of the region. The way in which these should be prepared is described in considerable detail, together with some guidance about what is envisaged for the seismotektonic maps. 6) Arrangement, duration of and participants in the fulfilment of the project. The names and addresses of the participating institutions for each region are given; the end of the first term will be at the end of 1962. The map is expected from the AN SSSR (AS USSR) in 1963. There are 60 Soviet-bloc references

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3,9300

AUTHORS: Nersesov, I.L., Rautian, T.G., Khalturin, V.I. and Riznichenko, Yu.V.

TITLE: Instructions for dynamic measurements on seismograms

SOURCE: Akademiya nauk SSSR. Institut fiziki Zemli. Trudy no. 17 (184). Moscow, 1961. Voprosy inzhenernoy seysmologii no. 5, 146-167

TEXT: The term " dynamic" signifies measurements of amplitude and period of oscillations, directions of first motion and duration of the trace, as opposed to kinematic measurements of times of arrival of phases. The objective is to obtain information of the strength and type of movement at the focus. Data from a long chain of stations are necessary and these data must be strictly comparable, on a uniform basis. It is assumed that

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all such stations are fitted with type CГК (SGK) or СВК (SVK) seismographs or others of similarly wide bandwidth. The instructions are based on experience of near earthquakes (up to 700 km) in Central Asia, but recommendations are also given for dealing with earthquakes out to 100° epicentral distance, where diffraction begins to affect matters. The instructions are divided into eight sections as follows: 1) Dynamic quantities determinable from seismograms. These are A_i, T_i, the amplitude and period of first arrivals of each phase; A_{max}, T_{max} the maximum amplitude and corresponding periods of each phase; A_m, T_m, the the mean ditto; τ the duration of each wave-group. A distinction is made between relative durection which is measured between points of amplitude one third the maximum, and the absolute duration which is measured between points of fixed amplitude. The latter clearly depends on the energy. 2) measurement of

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amplitude and period of first arrivals (details). 3) Separation of basic wave-groups on the trace (illustrated by examples). 4) Measurement of maximum amplitudes and the corresponding periods (details). 5) Measurement of mean amplitudes and mean periods (details). 6) Determination of total duration of seismic oscillation (definitions). 7) Calculation of seismic energy density. The formula evolved is

$$\mathcal{E} = 0.085 \frac{v}{v_s} \left[\frac{A_1^2}{T_1^2} \cdot \tau_1 + \frac{A_1^2}{T_2^2} \cdot \tau_2 + \ldots\ldots \frac{A_n^2}{T_n^2} \cdot \tau_n \right] \text{erg/cm}^2,$$

where the symbols are: v = velocity of given wave-group, V_s = velocity of S-waves, A = ground amplitude

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in mm, T = period in seconds of first arrivals of phases 1,2,... ... n and τ = duration of phases 1,2, ... n. This section is also illustrated by examples and a nomogram for rapid calculation is given. 8) Calculation of the seismic energy at the focus. This simply involves evaluation of $4\pi R^2 \mathcal{E}(R)$. Another nomogram is given for this. A third nomogram can be used for estimating magnitude. All these data should be reported on a special form designed for the purpose and a completed example is given. There are 13 figures.

S/169/62/000/011/006/077
D228/D307

AUTHOR: Koridalin, Ye.A., Masarskiy, S.I., Nersesov, I.L. and Kharin, D.A.

TITLE: Trial study of weak local earthquakes by means of temporary seismic stations

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 11, 1962, 18-19, abstract 11A92 (Studii şi cercetări astron. şi seismol., 6, no. 2, 1961, 161-172 (summary in Rum.))

TEXT: The seismicity of various districts of the Soviet Union is being studied by means of the investigation of weak local earthquakes. Investigations are being conducted in two directions: seismico-geologic and engineering-seismic. In the first the aim of the research is to obtain the general regular relations of the distribution of weak and strong local earthquake epicenters to the tectonics. The chief plan of the second is the problem of seismic local and micro-zoning. Work of this type was begun in 1927 in connection with the study of the seismicity of the Turksib Route. Next it was carried out in the Crimea, where the outline of the epicentral zone of local shocks was obtained; in Turkmeniya, where distribution

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patterns of the multiple shocks of the Ashkhabad earthquake of 1948 and problems of the seismic microzoning of the city of Ashkhabad were studied; in West Turkmeniya, with the aim of the detailed seismic zoning of the territory; and in other regions. The method of using mobile seismic stations, which was first applied in the Shemakhinskaya zone in 1953 and in the widest volume in the Tadzhik complex seismologic expedition, was specially practised. Here the questions of quantitatively studying the parameters of the seismic regime and the energy of weak earthquakes are being investigated particularly carefully. Electromagnetic ВЭГИК (VEGIK) seismographs are being used in the work, as are methods unrelated to the supposition that the crust is homogeneous, for determining the position of an epicenter; the accuracy of such determinations thereby reaches 1-2 km. The method of mobile stations with their locational profile is also being employed to study the depth structure of the crust. 9 references.
[Abstracter's note: Complete translation]

Card 2/2

KEYLIS-BOROK, Vladimir Isaakovich; NERSESOV, Igor' Leonovich; YAGLOM, Akiva Moiseyevich; SADOVSKIY, M.A., otv. red.; MEDER, V.M., red. izd-va; YEPIFANOVA, L., tekhn. red.

[Methods of evaluating the economic effect of earthquakeproof construction]Metodika otsenki ekonomicheskogo effekta seismostoikogo stroitel'stva. Moskva, Izd-vo Akad. nauk SSSR, 1962. 45 p. (MIRA 16:3)

1. Chlen-korrespondent Akademii nauk SSSR (for Sadovskiy).
(Earthquakes and building)

KRESTNIKOV, V.N.; NERSESOV, I.L.

Tectonic pattern of the Pamirs and Tien Shan and its relation to the surface relief of Mohorovicic. Sov.geol. 5 no.11:36-69 N '62. (MIRA 15:12)

1. Institut fiziki Zemli AN SSSR imeni O.Yu. Shmidta.
(Tien Shan—Geology—Structural) (Pamirs—Geology, Structural)

NERSESOV, I.L.; NIKOLAYEV, A.V.

Relation between the dominant frequencies in blasting and the size of the charge. Trudy Inst. fiz. Zem. no.25:95-100 '62. (MIRA 15:11)

(Blasting) (Seismology)

KONDRATENKO, A.M.; NERSESOV, I.L.

Some results of a study of a change in the velocity of longitudinal waves and the relation of the velocities of longitudinal and transverse waves in the focal zone. Trudy Inst. fiz. Zem. no.25:130-150 '62. (MIRA 15:11)

(Seismic waves)

NERSESOV, I.L.; TOKMULIN, M.Kh.

Graphic method for the selection of frequency-amplitude and phase characteristics of a seismic channel. Trudy Inst.fiz. Zem. no.32:20-33 '64. (MIRA 18:2)

NERSESOV, I.L.; RAUTIAN, T.G.

Kinematics and dynamics of seismic waves at distances of up to 3,500 km from the epicentre. Trudy Inst.fiz.Zem. no.32:63-87 '64. (MIRA 18:2)

L 34903-66 EWT(l) GW

ACC NR: AP6026256 SOURCE CODE: UR/0387/66/000/005/0033/0042

AUTHOR: Savarenskiy, Ye. F. (Doctor of physicomathematical sciences); Nersesov, I. L.; Karmaleyeva, R. M.; Latynina, L. A.

ORG: Institute of Physics of the Earth, AN SSSR (Institut fiziki Zemli AN SSSR)

TITLE: Long-period waves of the Aleutian earthquake of 4 February 1965 recorded by quartz extensometers

SOURCE: AN SSSR. Izvestiya. Fizika zemli, no. 5, 1966, 33-42

TOPIC TAGS: earthquake, Rayleigh wave, internal friction

ABSTRACT: This paper gives an analysis of long-period oscillations from the earthquake of 4 February 1965 which occurred in the Aleutian Islands. The tremor (M = 8.5) was recorded by extensometers at Talgar (Kazakh SSR) and Dzherino (Tadzhik SSR). It was possible to detect groups of Love waves from the 2d to 9th order with periods from 70 to 720 sec and groups of Rayleigh waves from the 2d to 13th order with periods of 120-330 sec. The dispersion curves of the group velocities of these waves were obtained. The authors determined the amplitudes of the displacements in the R and L waves, the coefficients of decrease of the amplitudes γ and the parameter Q, characterizing internal friction in the earth. The value Q agrees with the data obtained by other authors. The values Q, determined from Love waves, vary from 60 to 120 when T = 300-500; the values Q for Rayleigh waves vary in the range 150-200 when T = 200. Orig. art. has: 7 figures, 7 formulas, and 3 tables. [JPRS: 36,553]

SUB CODE: 08 / SUBM DATE: 03Aug65 / OTH REF: 005
UDC: 550.342(798)

Card 1/1 RLG 0916 1805

ACC NR: AP7013733 SOURCE CODE: UR/0425/66/009/012/0020/0023

AUTHOR: Katok, A. P.; Gayskiy, V. N.; Nersesov, I. L.; Mirzoyev, K. M.

ORG: Institute of Seismic Resistant Construction and Seismology, AN TadzhSSR (Institut seysmostoykogo stroitel'stva i seysmologii AN TadzhSSR)

TITLE: Analysis of fluctuations of the seismic regime

SOURCE: AN TadzhSSR. Doklady, v. 9, no. 12, 1966, 20-23

TOPIC TAGS: seismology, earthquake

SUB CODE: 08

ABSTRACT: The accuracy and reliability of determining the mean long-term frequency of earthquakes is dependent on the value and character of variations of the seismic regime at the time of observations. The available approach is inadequate and the authors therefore have developed a method for defining the characteristics of temporal variations of the seismic regime which makes it possible to estimate the accuracy of determination of the long-term frequency of earthquakes of different energy classes and detect the periods of systematic changes in the course of the process. Data accumulated in recent years indicates a more complex dependence between R (the measure of dispersion of the frequency of earthquakes) and the properties of the seismic process than believed to exist earlier; contrary to

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ACC NR: AP7013733

former ideas, it may not be a sufficiently objective characteristic of the seismic process. The parameter λ is proposed as an objective quantitative characteristic of the dispersion of the frequency of earthquakes of a particular energy in a given region, making it possible to define brief disruptions of the seismic regime. This paper was presented by Academician AN TadzhSSR O. V. Dobrovol'skiy on 10 September 1966. Orig. art. has: 3 figures, 3 formulas and 1 table. [JPRS: 40,106]

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L 38523-66

ACC NR: AP6029156 SOURCE CODE: CZ/0023/66/010/002/0172/0176

AUTHOR: Alekseyev, A. S.; Nersesov, I. L.

ORG: Computer Center, Siberian Department, AN SSSR, Novosibirsk (Vychislitel'nyy tsentr Sibirskogo otd. AN SSSR); Institute of Geophysics, AN SSSR, Moscow (Institut Fiziki Zemli AN SSSR)

TITLE: Travel times and amplitudes of waves in Central Asia -- theory and experiments 44 B

SOURCE: Studia geophysica et geodaetica, v. 10, no. 2, 1966, 172-176

TOPIC TAGS: seismic wave, shock wave analysis

ABSTRACT: The article presents a new interpretation of the results of observations of body waves, obtained in deep seismic sounding and in observations of earthquakes in Central Asia. Orig. art. has: 4 figures. [Orig. art. in Eng.] [JPRS: 36,844]

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Card 1/1

LALABYEKOV, S. K., and NERSESOV, L. G.

"Technological Diagrams of Contemporary Processes in the Working (Processing) of Petroleum," Moscow, 1950

XXX

FEDOROV, V.S.; RYABCHIKOV, V.R.; POLYAKOV, I.S.; SOROKIN, N.I.; RYABYKH, P.M.; NOVIK, N.G.; SLEPUKHA, T.F.; DRASHKOVSKIY, K.M.; LALABEKOV, S.K.; ANEF'YEV, A.P.; YEVSTAF'YEV, V.V.; ZVEREV, A.P.; NERSESOV, L.G.; GROSSMAN, E.I.; BERMAN, A.O.

Petr Aleksandrovich Smirnov, 1902-1958; obituary. Khim. i tekh. topl. i masel. 3 no.12:68 D '58. (MIRA 11:12)
(Smirnov, Petr Aleksandrovich, 1902-1958)

NERSESOV, P.V.

Designing steel rods for the joint action of flexure and axial compression. Trudy GPI [Gruz.] no.5:81-89 '61.
(MIRA 15:12)

(Steel, Structural)
(Elastic rods and wires)

ZAYONCHKOVSKIY, P.A., professor, redaktor; NERSESOVA, E.A., kandidat istoricheskikh nauk, redaktor; SIMON, K.P., kandidat pedagogicheskikh nauk, redaktor; TEREKHOVA, D.F., tekhnicheskiy redaktor

[Dissertations for doctoral and candidate degrees defended at Moscow State University from 1934 to 1954; a bibliography] Doktorskie i kandidatskie dessertatsii zashchishchennye v Moskovskom gosudarstvennom universitete s 1934 po 1954 g.; bibliograficheskii ukazatel'. Pod red. P.A.Zaionchkovskogo, E.A.Nersesovoi, K.R.Simona. [Moskva] No.1. [Departments: Mechanics and mathematics, physics, chemistry] Fakul'tety: Mekhaniko-matematicheskii, Fizicheskii, Khimicheskii. 1956. 254 p. (MLRA 9:8)

1. Moscow. Universitet. Nauchnaya biblioteka imeni A.M.Gor'kogo. (Bibliography--Science)

NERSESOVA, E.A.

ZAYONCHKOVSKIY, P.A., prof., red.; NERSESOVA, E.A., kand.ist.nauk, red.; SIMON, K.R., kand.ped.nauk, red.; YERMAKOV, M.S., tekhn.red.

[Doctoral and candidate dissertations accepted at Moscow University from 1934 to 1954; bibliographical list.] Doktorskie i kandidatskie dissertatsii zashchishchennye v Moskovskom gosudarstvennom universitete s 1934 po 1954 g.; bibliograficheskii ukazatel'. Pod red. P.A. Zaionchkovskogo i dr.. Moskva. Pt.2. [Faculties: Geology, Geography, Biology-soil science] Fakul'tety: Geologicheskii, Geograficheskii, Biologo-pochvennyi, 1957. 217 p. (MIRA 11:3)

1. Msocow. Universitet. Biblioteka.
(Bibliography--Geology) (Bibliography--Geography)
(Bibliography--Biology)

PETROSYAN, A. (Baku); NERSESOVA, M. (Baku)

Formation of production funds on collective farms. Vop. ekon. no.12:142-144 D '61. (MIRA 14:11)

(Collective farms)

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NERSESOVA, Z. A.

"Temperature Variation of Ground Iciness," Dok Ak Nauk SSSR, Vol 75, No 6, pp 845, 846, Dec 1950.

Inst. of Permafrost im. V. A. Obruchev, AS USSR

U- 1528, 10 Oct 51

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R001136620(

NERSESOVA, Z.A.

SIRS L No. 45

Nersesova, Z.A. (G.A. Obruchev Institute of Refrigeration, U.S.S.R. Academy of Sciences). The melting of ice in the ground at temperatures below 0°C, 507-8

Akademiya Nauk S.S.S.R., Doklady Vol. 79 No. 3, 1951

NERSESOVA, Z.A.

Phase states of water in ground freezing and thawing. Mat.po lab.issl.merzl.grunt.1:37-51 '53. (MLRA 7:2)
(Frozen ground) (Water)

NERSESOVA, Z. A.

"Calorimetric Method of Determination of the Iciness of Grounds"
Sb. Materialy po Laboratornym Issledovaniyam Merzlykh Gruntov, No 1, 77-48, 1953

As a result of the comparison of the data from dilatometric and calorimetric methods of investigation the author recommends as the most reliable the calorimetric method for the investigation of frozen grounds. He recommends also the calorimetric method for the determination of ice. (RZhGeol, No 6, 1954)

SO: Sum. 492, 12 May 55

NERSESOVA, Z.A., starshiy nauchnyy sotrudnik

Directions for determining the quantity of unfrozen water and ice in frozen ground. Mat.po lab.issl.merzl.grunt. no.2:55-57 '54. (MIRA 8:8)

1. TSentral'naya laboratoriya Instituta merzlotovedeniya Akademii nauk SSSR.

(Frozen ground)

NERSESOVA, Z.A., starshiy nauchnyy sotrudnik

Directions for determining the heat capacity of frozen ground. Mat.po lab.issl.merzl.grunt. no.2:100-110 '54. (MIRA 8:8)

1. TSentral'naya laboratoriya Instituta merzlotovedeniya Akademii nauk SSSR.

(Frozen ground)

NERSESOVA, Z.A., kandidat geologo-mineralogicheskikh nauk, otvetstvennyy redaktor

[Basic concepts and terms in geokryology (the science of frozen ground).] Osnovnye poniatiia i terminy geokriologii (merzlotovedeniia). Moskva, 1956. 15 p. (MLRA 10:5)

1. Akademiya nauk SSSR. Institut merzlotovedeniya.
(Frozen ground--Terminology)

NERSESOVA, Z.A.

TSYTOVICH, N.A.; NERSESOVA, Z.A.; BOZHENOVA, A.P.; TATYUNOV, I.A.; DOSTOVALOV, B.N.; SHUMSKIY, P.A.; BAKULIN, F.G.; SAVEL'YEV, B.A.; ZHUKOV, V.F.; MAKSYMOV, G.A.; VYALOV, S.S.; SHUSHERINA, Ye.P.

Physical phenomena and processes in freezing, frozen, and thawing soils; general comments. Mat. po lab. issl. merzl. grunt. no.3:7-114 '57. (MIRA 10:11)

(Frozen ground)

NERSESOVA Z.A.

NERSESOVA, Z.A.

Change in the active surface of soils at temperatures below and above freezing point. Mat. lab. issl. merzl. grunt. no.3:163-167 '57. (MIRA 10:11)

(Frozen ground) (Cations)

NERSESOVA, Z.A.

NERSESOVA, Z.A.

Effect of exchangeable cations on water phase composition in frozen soils. Mat. po lab. issl. merzl. grunt. no.3:168-176 '57.
(Frozen ground) (Cations) (Soil moisture) (MIRA 10:11)

NERSESOVA, Z.A.

Effect of exchange cations on the migration of water and the heaving of ground during freezing. Issl.po fiz. i mekh. merzl. grun. no.4:22-52 '61. (MIRA 14:12)
(Frozen ground)

NERSESOVA, Zinaida Aleksandrovna, TYSTOVICH, Nikolay Aleksandrovich

"Concerning unfrozen water in frozen soils"

report to be submitted for the Intl. Conference on Permafrost, Purdue Univ., Lafayette, Indiana, 11-15 Nov 63

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TYUTYUNOV, Ivan Alekseyevich, doktor geol.-miner. nauk; NERSESOVA, Zinaida Aleksandrovna; STOLYAROV, A.G., red.izd-va; RYLINA, Yu.V., tekhn. red.

[The nature of the movement of water in soils during freezing, and the bases of physical and chemical methods of controlling heave] Priroda migratsii vody v gruntakh pri promerzanii i osnovy fiziko-khimicheskikh priemov bor'by s pucheniem. Moskva, Izd-vo AN SSSR, 1963. 157 p. (MIRA 16:10)

(Frozen ground)

PETROVSKIY, B.V.; NERSESYAN, A.A.; RYBKIN, I.N. (Moskva)

Bilateral ligation of the internal mammary artery in stenocardia; preliminary report. Klin.med. 37 no.11:52-55 N '59. (MIRA 13:3)

1. Iz gospital'noy khirurgicheskoy kliniki (direktor - deystvitel'nyy chlen AMN SSSR prof. B.V. Petrovskiy) i propedevticheskoy terapevticheskoy kliniki (direktor - deystvitel'nyy chlen AMN SSSR prof. V.Kh. Vasilenko) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M. Sechenova.

(ANGINA PECTORIS surgery)
(THORAX blood supply)

NERSESYAN, A.A.

Surgical treatment of chronic coronary insufficiency by bilateral ligation of the internal mammary artery; survey of foreign literature. Khirurgiia 36 no.3:125-129 Mr '60. (MIRA 13:12)
(CORONARY HEART DISEASE) (BREAST—BLOOD SUPPLY)

NERSESYAN, A.A.; RYBKIN, I.N. (Moskva)

Immediate and late results of bilateral ligation of the internal thoracic artery in stenocardia. Klin.med. no.1:44-48 '62. (MIRA 15:1)

1. Iz gospital'noy khirurgicheskoy kliniki (dir. - deystvitel'nyy chlen AMN SSSR prof. B.V. Petrovskiy) i propedevticheskoy terapevticheskoy kliniki (dir. - deystvitel'nyy chlen AMN SSSR prof. V.Kh. Vasilenko) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M. Sechenova.

(ANGINA PECTORIS) (THORACIC ARTERY)

16(1)

SOV/22-11-5-7/9

AUTHORS: Dzhrbashyan, M.M. and Nersesyan, A.B.

TITLE: Criteria for the Possibility of Expanding Functions into Dirichlet Series (Kriterii razlozhimosti funktsiy v ryady Dirikhle)

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR, Seriya fiziko-matematicheskikh nauk, 1958, Vol 11, Nr 5, pp 85 - 106 (USSR)

ABSTRACT: Let $F(\sigma)$ be defined and continuous on $(\sigma_0, +\infty)$; $\alpha > 0$. Then let

$$\frac{d_e^{-\alpha} F(\sigma)}{d_e \sigma^{-\alpha}} = \frac{1}{\Gamma(\alpha)} \int_{\sigma}^{\infty} (e^{-\sigma} - e^{-u})^{\alpha - 1} e^{-u} F(u)\, du$$

Let the sequence $\{\mu_n\}$ satisfy the condition: $\mu_0 = 0$, $0 < \mu_{k+1} - \mu_k \leq 1$, $\lim\limits_{k \to \infty} \mu_k = \infty$. Let be

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Criteria for the Possibility of Expanding Functions Into Dirichlet Series SOV/22-11-5-7/9

$$L^{(\mu_k)}F(\sigma) = -\frac{d_{e^{-\alpha_k}}}{d_{e^{-\alpha_k}}\sigma}\left\{ e^{\sigma}\frac{d}{d\sigma}L^{(\mu_{k-1})}F(\sigma)\right\},\ \alpha_k = 1-(\mu_k-\mu_{k-1}) .$$

Let be $F(\sigma)\in L(\mu_n,\sigma_o)$, if all $L^{(\mu_k)}F(\sigma)$ are continuous on $(\sigma_o,+\infty]$ and if the $e^{\sigma}\frac{d}{d\sigma}L^{(\mu_k)}F(\sigma)$ are continuous and absolutely integrable on (σ_o,∞). Then it is

$$F(\sigma) = \sum_{k=o}^{n}\frac{L^{(\mu_k)}F(+\infty)}{\Gamma(1+\mu_k)}e^{-\mu_k\sigma} + R_n(F,\sigma)$$

Let be $F(\sigma)\in L^*(\mu_n,\sigma_o)\in L(\mu_n,\sigma_o)$, if on $[\sigma_o, +\infty]$ it is uniformly $\lim\limits_{n\to\infty} R_n = 0$.

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Criteria for the Possibility of Expanding Functions Into Dirichlet Series

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Theorem : From $F(\sigma)\in L(\mu^{*}_{n},\sigma_{o})$ and

$$\sup_{(\sigma_{o},+\infty]} \left|L^{(\mu_{k})}F(\sigma)\right| \leqslant Me^{-\sigma_{o}\mu_{k}}\Gamma(1+\mu_{k})$$

it follows $F(\sigma)\in L^{*}(\mu_{n},\sigma_{o})$, i.e.

$$F(\sigma) = \sum_{k=o}^{\infty} \frac{L^{(\mu_{k})}F(+\infty)}{\Gamma(1+\mu_{k})} e^{-\mu_{k}\sigma}$$

Several similar results are given. Altogether there are 7 longer theorems and several lemmata.

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Criteria for the Possibility of Expanding Functions Into Dirichlet Series SOV/22-11-5-7/9

There are 4 references, 1 of which is Soviet, 1 English, 1 French, and 1 American.

ASSOCIATION: Institut matematiki i mekhaniki AN Armyanskoy SSR, Yerevanskiy gosudarstvennyy universitet (Institute of Mathematics and Mechanics, AS Armenian SSR, Yerevan State University)

SUBMITTED: March 29, 1958

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16(1)

AUTHORS: Dzhrbashyan, M.M. and Nersesyan, A.B. SOV/22-11-5-8/9

TITLE: Some Integro-Differential Operators and the Classes of Quasi-Analytic of Functions Connected With Them (Nekotoryye integro-differentsial'nyye operatory i svyazannyye s nimi kvazi-analiticheskiye klassy funktsiy)

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR. Seriya fiziko-matematicheskikh nauk, 1958, Vol 11, Nr 5, pp 107 - 120 (USSR)

ABSTRACT: By means of fractional integration operations in the sense of Riemann - Liouville and Hermann Weyl the author defines classes of functions which on $(0, +\infty)$ or on $(-\infty, +\infty)$ are infinitely often differentiable in the generalized sense. For the introduced classes of functions the author gives conditions for quasi-analyticity, i.e. conditions defining uniquely the functions of these classes.

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Some Integro-Differential Operators and the Classes of Quasi-Analytic of Functions Connected With Them SOV/22-11-5-8/9

There are 4 references, 3 of which are Soviet, and 1 is American.

ASSOCIATION: Institut matematiki i mekhaniki Akademii nauk Armyanskoy SSR (Institute of Mathematics and Mechanics, AS Armenian SSR)

SUBMITTED: April 17, 1958

AKOPYAN, S.A.; NERSESYAN, A.B.

Some integrodifferential operators and expansions into series, analogous to Schloemilch's series. Dokl.AN Arm.SSR 27 no.4: 201-207 '58. (MIRA 12:1)

1. Institut matematiki i mekhaniki AN Armyanskoy SSR. Predstavleno M.M.Dzhrbashyanom.
(Functional analysis) (Series)

AUTHOR: Dzhrbashyan, M.M. (Member of the Academy of Sciences of the Armenian SSR), Nersesyan, A.B. SOV/20-121-2-4/53

TITLE: On the Application of Some Integro-Differential Operators (O primenenii nekotorykh integro-differentsial'nykh operatorov)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 2, pp 210-213 (USSR)

ABSTRACT: In five partially very long theorems the author formulate some new results of the theory of Dirichlet series and on quasianalytic function classes. The results are obtained by the introduction of special integro-differential operators which are combined with the broken integration in the sense of Riemann-Liouville or H.Weyl. Let e.g. $F(\sigma)$ be defined on $(\sigma_0, +\infty)$ and continuous; for every $\alpha > 0$ let the operator

$$\frac{d_e^{-\alpha} F(\sigma)}{d_e \sigma^{-\alpha}} \equiv \frac{1}{\Gamma(\alpha)} \int_{\sigma}^{\infty} (e^{-\sigma} - e^{-u})^{\alpha - 1} e^{-u} F(u)\, du$$

be introduced; let the sequence $\{\mu_n\}$ satisfy the condition

$$\mu_0 = 0, \quad 0 < \mu_{k+1} - \mu_k \leq 1 \quad (k \geqslant 0), \quad \lim_{k \to \infty} \mu_k = +\infty;$$

let $\alpha_k = 1 - (\mu_k - \mu_{k-1})$ $(k = 1, 2, \ldots)$; let the following operators

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On the Application of Some Integro-Differential Operators SOV/20-121-2-4-53

be introduced:

$$L^{(\mu_0)}F(\sigma) \equiv F(\sigma), \quad L^{(\mu_k)}F(\sigma) \equiv -\frac{d_e^{-\alpha_k}}{d_e\sigma^{-\alpha_k}}\left\{e^{\sigma}\frac{d}{d\sigma}L^{(\mu_{k-1})}F(\sigma)\right\},\ k \geqslant 1.$$

The function $L^{(\mu_k)}F(\sigma)$ is called continuous on $(\sigma_0, +\infty)$ if 1) it is continuous on $(\sigma_0, +\infty)$ and 2) there exists the limit value $L^{(\mu_k)}F(+\infty) = \lim_{\sigma \to \infty} L^{(\mu_k)}F(\sigma)$. Let $F(\sigma) \in L(\mu_n; \sigma_0)$ if on $(\sigma_0, +\infty]$ there exist all functions $L^{(\mu_k)}F(\sigma)$ and are continuous and if on $(\sigma_1, +\infty)$ the functions $e^{\sigma}\frac{d}{d\sigma}L^{(\mu_k)}F(\sigma)$ are continuous and absolutely integrable, where $\sigma_1 > \sigma_0$ is arbitrary.

Theorem: If $F(\sigma) \in L(\mu_n; \sigma_0)$, then for every $n \geqslant 0$ and $\sigma \in (\sigma_0, +\infty]$ there holds the formula

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On the Application of Some Integro-Differential Operators SOV/20-121-2-4/53

$$F(\sigma) = \sum_{k=0}^{n} \frac{L^{(\mu_k)} F(+\infty)}{\Gamma(1+\mu_k)} e^{-\mu_k \sigma} + \frac{1}{\Gamma(\mu_{n+1})} \int_{\sigma}^{+\infty} (e^{-\sigma} - e^{-u})^{\mu_{n+1}-1} e^{-u} L^{(\mu_{n+1})} F(u) du.$$

Two further theorems contain conditions for the developability in the Dirichlet series if the function belongs to certain subclasses of $L(\mu_n; \sigma_o)$. Further results are combined with the introduction of certain generalized differential operators and with the use of Weyl's integral of the order α.
There is 1 Soviet reference.

ASSOCIATION: Institut matematiki i mekhaniki Akademii nauk Arm.SSR (Institute for Mathematics and Mechanics of the Academy of Sciences of the Armenian SSR)

SUBMITTED: April 21, 1958

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S/022/59/012/05/02/009

16.4100

AUTHORS: Dzhrbashyan, M.M., Nersesyan, A.B.

TITLE: On the Construction of Some Special Biorthogonal Systems

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR. Seriya fiziko- matematicheskikh nauk, 1959, Vol.12, No. 5, pp. 17-42

TEXT: Let $y(x, \lambda)$ and $z(x, \lambda)$ be entire functions in λ which belong to the class $L_1(0,1)$ together with their derivatives with respect to λ for every fixed λ with respect to x. Furthermore let all functions

$$(1.1) \quad \frac{\partial^r y(x,\lambda)}{\partial \lambda^r}, \quad \frac{\partial^s z(x,\lambda^*)}{\partial \lambda^{*s}} \qquad (r,s = 0,1,2,\ldots)$$

belong to $L_1(0,1)$, where λ, λ^* are arbitrarily fixed. Furthermore let $\Omega(\lambda)$ be an entire function and

$$(1.2) \quad \int_0^1 y(x,\lambda) z(x,\lambda^*) dx = \frac{\Omega(\lambda) - \Omega(\lambda^*)}{\lambda - \lambda^*}$$

for all λ, λ^*. Let the function $\Omega(\lambda) - A_0$ possess denumerably many zeros

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On the Construction of Some Special Biorthogonal Systems

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λ_1, $0 \leqslant |\lambda_1| \leqslant |\lambda_2| \leqslant \cdots \leqslant |\lambda_n| \leqslant \ldots$, where A_0 is in general a complex number. Let p_n be the multiplicity of the zero λ_n. The systems of functions

$$(1.8) \qquad \frac{\partial^j y(x, \lambda_n)}{\partial \lambda_n^j} \quad (j = 0,1,\ldots,p_n - 1) \qquad \text{and}$$

$$(1.9) \qquad \sum_{k=o}^{p_n-j-1} \frac{b_{p_n-j-k-1}}{k!j!} \frac{\partial^k z(x,\lambda_n)}{\partial \lambda_n^k} \qquad (j = 0,1,\ldots,p_n - 1)$$

are to correspond to the zero λ_n. $\{Y_\alpha(x)\}$ and $\{Z_\alpha(x)\}$, $\alpha = 1,2,\ldots$ denote the sets of all functions of the type (1.8) or (1.9) which are indexed in the sequence of the increasing moduli of the numbers λ_n.

Theorem 1 : The systems $\{Y_\alpha(x)\}$ and $\{Z_\alpha(x)\}$ are biorthogonal on $[0,1]$, i.e.

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$$(1.10)\quad \int_0^1 Y_\alpha(x) Z_\beta(x)\,dx = \begin{cases} 0, & \alpha \neq \beta \\ 1, & \alpha = \beta \end{cases} \qquad (\alpha, \beta = 1, 2, \ldots)$$

Then the described general method is used in order to obtain biorthogonal systems from combinations of Mittag - Leffler functions. 1 theorem and 6 lemmata are given.
There are 5 references : 4 Soviet and 1 Swedish.

ASSOCIATION: Institut matematiki i mekhaniki AN Armyanskoy SSR (Institute of Mathematics and Mechanics AS Armenian SSR)
Yerevanskiy gosudarstvennyy universitet (Yerevan State University)

SUBMITTED: September 9, 1959

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S/022/59/012/06/02/009

AUTHOR: Nersesyan, A. B.

TITLE: The Expansion in Terms of Eigenfunctions of a Boundary Value Probelm for an Integro-differential Equation With Lagging Argument

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR. Seriya fiziko-matematicheskikh nauk, 1959, Vol. 12, No. 6, pp. 37-68

TEXT: The operators

$$(1.1)\quad Ly = -y'' + \sum_{i=1}^{m} q_i(x)\, y\,(x - \Delta_i(x)) + \int_0^x K(x,t)\, y\,(t)\, dt$$

and

$$(1.1^*)\quad L^* z = -z''(x) + \sum_{i=1}^{m} q_i^*(x)\,(x + \Delta_i^*(x)) + \int_x^{\ell} K(t,z)\, z\,(t)\, dt$$

are considered on $[0, 1]$, where $\Delta_i(x) \geqq 0$, $\Delta_i(1) < 1$, $\Delta_i'(x) \leq \theta < 1$, $q_i(x)$ real, $q_i(x) \equiv 0$ for $x - \Delta_i(x) < 0$, $q_i(x)$ continuous for $x - \Delta_i(x) \geqq 0$;

$$(1.2)\quad \int_0^{\ell} \int_t^{\ell} |K(t_1, t)|\, dt_1 dt < +\infty,$$

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The Expansion in Terms of Eigenfunctions of a Boundary Value Probelm for an Integro-differential Equation With Lagging Argument

(1.3) $\varphi_i(x) \equiv x - \Delta_i(x), \varphi_i^{-1}(x) \equiv \psi_i(x) \equiv x + \Delta_i^*(x)$

(1.5) $q_i^*(x) = 0$ for $\psi_i(1) < x < 1$ and $= q_i(\psi_i(x))\psi_i'(x)$ for $0 \leq x \leq \psi_i(1)$, $i = 1, 2, \ldots, m$. In § 1 the author sets up the boundary value probelms (A) (1.6) $Ly = \lambda y$, (1.7) $y(0) \cos\alpha + y'(0) \sin\alpha = 0$, (1.8) $y(1) \cos\beta + y'(1) \sin\beta = 0$ and (A^*) (1.6*) $L^*z = \lambda z$, (1.7*) $z(0) \cos\alpha + z'(0) \sin\alpha = 0$ (1.8*) $z(1) \cos\beta + z'(1) \sin\beta = 0$ and investigates the asymptotic behavior of the eigenfunctions and eigenvalues. In § 2 he constructs the Green function of the considered integro-differential operator. In § 3 the author sets up a biorthogonal system of the eigen- and adjoint functions of the boundary value probelms (A) and (A^*). The asymptotic formulas are improved. In § 4 under additional restrictions the author gives theorem on the expansions in terms of eigen- and adjoint functions, on the convergence of the expansions in the mean and on the simultaneous convergence of the expansions with the ordinary Fourier series. The author gives 16 theorems and lemmata altogether.

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The Expansion in Terms of Eigenfunctions of a Boundary Value Probelm for an Integro-differential Equation With Lagging Argument

S. B. Norkin is mentioned in the paper. The author thanks his teacher M. M. Dzhrbashyan, Academician of the Academy of Sciences of the Armenian SSR, for advices.
There are 8 references: 5 Soviet, 1 English, 1 Polish and 1 French.

ASSOCIATION: Institut matematiki i mekhaniki AN Armyanskoy SSR (Institue of Mathematices and Mechanics AS Armenian SSR)

SUBMITTED: June 12, 1959

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SOV/20-129-3-10/70

AUTHOR: Nersesyan, A.B.

TITLE: Expansion in Eigenfunctions of an Integro-Differential Equation Having a Lagging Argument

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 3, pp 511-514 (USSR)

ABSTRACT: Let

(1.1) $$Ly = -y'' + \sum_{i=1}^{m} q_i(x) y(x - \Delta_i(x)) + \int_0^x K(x,t) y(t) dt,$$

where

(1.2) $\Delta_i(x) \geqslant 0$, $\Delta_i(1) < 1$, $\Delta_i'(x) \leqslant \theta < 1$ $(0 \leq x \leq 1)$;

$q_i(x)$ real and continuous for $0 \leq x - \Delta_i(x) \leq 1$,

(1.3) $$q_i(x) \equiv 0 \text{ for } x - \Delta_i(x) < 0$$

and

(1.4) $$\int_0^1 \int_t^1 |K(t_1, t)| \, dt_1 dt < +\infty .$$

Let

(1.5) $$\varphi_i(x) \equiv x - \Delta_i(x).$$

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Expansion in Eigenfunctions of an Integro-Differential Equation Having a Lagging Argument SOV/20-129-3-10/70

Then there exist

(1,5*) $\psi_i(x) = \varphi_i^{-1}(x) \equiv x + \Delta_i^*(x), \quad (0 \leq x \leq \varphi_i(1))$,

where

(1,2*) $\Delta_i^*(x) \geqslant 0, \quad \frac{d}{dx} \Delta_i^*(x) = \frac{\Delta_i'(x)}{1 - \Delta_i'(x)}$.

Let

(1,1*) $L^* z = -z'' + \sum_{i=1}^{m} q_i^*(x) z(x + \Delta_i^*(x)) + \int_x^1 K(t,x) z(t) dt$,

where

(1,3) $q_i^*(x) = 0$ for $\varphi_i(1) < x < 1$ and $q_i^*(x) = q_i(\psi_i(x)) \varphi_i'(x)$ for $0 \leq x \leq \varphi_i(1)$.

The author considers the boundary value problems

(A) $\begin{cases} Ly = \lambda y \\ y(0)\cos\alpha + y'(0)\sin\alpha = 0 \\ y(1)\cos\beta + y'(1)\sin\beta = 0 \end{cases}$ (A*) $\begin{cases} L^*z = \lambda z \\ z(0)\cos\alpha + z'(0)\sin\alpha = 0 \\ z(1)\cos\beta + z'(1)\sin\beta = 0 \end{cases}$.

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Let $y(x,\lambda)$ and $z(x,\lambda)$ be the solutions of

(1.9) $Ly = \lambda y,\quad 0 \leq x \leq 1,\quad y(0,\lambda) = \sin\alpha,\quad y'_x(0,\lambda) = -\cos\alpha$

(1.9*) $L^* z = \lambda z,\quad 0 \leq x \leq 1,\quad z(1,\lambda) = \sin\beta,\quad z'_x(1,\lambda) = -\cos\beta$.

It is stated that the eigenvalues of (A) and (A^*) are identical and for a sufficiently large absolute value they have the form

(2.6) $\sqrt{\lambda_n} = \frac{\pi n}{1} + 0(\frac{1}{n})$ $(n \geq n_0)$ for $\sin\alpha \neq 0$, $\sin\beta \neq 0$ or $\sin\alpha = \sin\beta = 0$

(2.7) $\sqrt{\lambda_n} = \frac{\pi}{1}(n + \frac{1}{2}) + 0(\frac{1}{n})$, $(n \geq n_0)$, for $\sin\alpha = 0$, $\sin\beta \neq 0$ or $\sin\alpha \neq 0$, $\sin\beta = 0$.

The author gives asymptotic formulas for $y(x,\lambda)$, $z(x,\lambda)$ (for $|\lambda| \to \infty$), where in the special case a result of S.B.Norkin is obtained.

The eigenvalues of (A) are zeros of

(2.1) $\omega(\lambda) = y(1,\lambda)\cos\beta + y'_x(1,\lambda)\sin\beta$.

Let λ_n be a p_n-fold zero. To every λ_n there correspond the sequences

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(3.1) $\frac{\partial^j y(x,\lambda_n)}{\partial \lambda^j}$ $(t=0,1,\dots,p_n-1)$

and

(3.1*) $\sum_{k=1}^{p_n-j-1} \frac{b^{(n)}_{p_n-j-k-1}}{k!j!} \frac{\partial^k z(x,\lambda_n)}{\partial \lambda_n^k}$ $(j=0,1,\dots,p_n-1)$,

where

$$b_k^{(n)} = \frac{1}{k!} \frac{d^k}{d\lambda^k}\left[\frac{(\lambda-\lambda_n)^{p_n}}{\omega(\lambda)}\right]_{\lambda=\lambda_n}.$$

Let $\{y_k(x)\}$ and $\{z_k(x)\}$ be the sets of all functions (3.1) and (3.1*), respectively. The system $\{y_k(x), z_k(x)\}$ is biorthogonal.

Theorem: If the $q_i(x)$ almost everywhere on $[0,1]$ have bounded derivatives and if $K(x,t) = \frac{K_1(x,t)}{(x-t)^\sigma}$, $0 \leq \sigma \leq 1$, where the integrals

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of $\frac{\partial K_1}{\partial x}$ and $\frac{\partial K_1}{\partial t}$ are bounded with respect to x and t, then for every function f(x) integrable on (0,1) according to Lebesgue it holds for $\sin\alpha \neq 0$, $\sin\beta \neq 0$:

$$\lim_{n\to\infty}\left\{\sum_{k=o}^{n} y_k(x)\int_0^1 f(t)z_k(t)dt - \frac{1}{1}\int_0^1 f(t)dt - \frac{2}{1}\sum_{k=1}^{n}\cos\frac{\pi k}{1}x\int_0^1 f(t)\cdot\cos\frac{\pi k}{1}t\,dt\right\} = 0$$

uniformly on the whole interval.

The author thanks M.M.Dzhrbashyan, Academician of the AS of the Armenian SSR, for the theme and for aid. There are 3 Soviet references.

ASSOCIATION: Institut matematiki i mekhaniki Akademii nauk Arm SSR (Institute of Mathematics and Mechanics AS Arm SSR)

PRESENTED: July 9, 1959, by V.A.Ambartsumyan, Academician
SUBMITTED: May 3, 1959

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Expansion in Special Biorthogonal Systems and Boundary Value Problems for Fractional-Order Differential Equations

S/020/60/132/04/04/064

systems. The results are discrete analogies of the theory of singular integral transformations developed by Dzhrbashyan (Ref.1). There is 1 Soviet reference.

ASSOCIATION: Institut matematiki i mekhaniki Akademii nauk Arm SSR (Institute of Mathematics and Mechanics AS Arm SSR) Yerevanskiy gosudarstvennyy universitet (Yerevan State University).

SUBMITTED: February 9, 1960

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16.3400 16.4100

AUTHORS: Dzhrbashyan, M.M., Academician AS Arm SSR
and Nersesyan, A.B. 16

TITLE: Expansion in Special Biorthogonal Systems and Boundary Value Problems for Fractional-Order Differential Equations 16

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 4, pp. 747-750

TEXT: The authors investigate special systems biorthogonal on the interval [0,1] which are formed by linear combinations of functions of the Mittag-Leffler type

(1) $$E_\varsigma(z;\mu) = \sum_{k=0}^{\infty} \frac{z^k}{\Gamma(\mu+k\varsigma^{-1})} \quad (\mu>0,\ \varsigma\geqslant\frac{1}{2}).$$

It is stated that the expansions in terms of these functions converge simultaneously with the ordinary Fourier series. On a finite interval the authors formulate conjugated boundary value problems for differential equations of fractional order $\frac{1}{\varsigma}$ $(\varsigma\geqslant\frac{1}{2})$, the adjoined and eigenfunctions of which for special parameter values agree with the considered biorthogonal

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16.3400

AUTHOR: Nersesyan, A.B.

TITLE: Expansion in Eigenfunctions of Some Non-Selfadjoint Boundary Value Problems

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol.135, No.5, pp.1050-1053

TEXT: Let a(x), b(x) be complex-valued functions of bounded variation on $[0,l]$, $0 < l < +\infty$; let it be continuous at the ends of the interval $[0,l]$ and let exist the Riemannian-Stieltjes integral

(1) $$\int_0^l a(x)d\, b(x).$$

Let the real functions $\Delta_i(x)$, $x \in [0,l]$, $i = \overline{1,m}$ be differentiable and let

(2) $$\Delta_i(x) \geqslant 0, \quad \Delta_i(l) < l, \quad \Delta_i'(x) \leqslant \theta < 1.$$

Let the complex-valued functions $q_i(x) \in L_1(0,l)$ be equal to zero for $x - \Delta_i(x) < 0$. Let the complex-valued kernel $K(x,t)$ $(0 \leqslant t \leqslant x \leqslant l)$ satisfy

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(3) $$\int_0^1 \int_t^1 |K(x,t)|\,dx\,dt < +\infty .$$

Let

(4) $$\varphi_i(x) \equiv x - \Delta_i(x), \quad x \in [0,1], \quad i = \overline{1,m}.$$

From (2) it follows the existence of the functions

(5) $$\psi_i(x) = \varphi_i^{-1}(x) \equiv x + \Delta_i^*(x), \quad \Delta_i^*(x) \geqslant 0 \quad (\varphi_i(0) \leqslant x \leqslant \varphi_i(1), \quad i = \overline{1,m}).$$

In the class of functions of bounded variation on $[0,1]$ the author considers problem (A):

(6) $$\frac{d}{dx}\left[y(x) - a(x)\right] + \sum_{i=1}^{m} q_i(x)\,y(x - \Delta_i(x)) + \int_0^x K(x,t)\,y(t)\,dt = \lambda y(x),$$

(7) $$y(0) = \alpha,$$

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(8) $$\beta y(1)+\int_0^1 y(x)d\ b(x) = A_0 .$$

Problem (A*):

(6*) $$-\frac{d}{dx}\left[z(x)+b(x)\right]+\sum_{i=1}^{m} q_i^*(x)z(x+\Delta_i^*(x))+\int_x^1 K(t,x)z(t)dt = \lambda z(x),$$

(7*) $$\alpha z(0)+\int_0^1 z(x)d\ a(x) = A_0,$$

(8*) $$z(1) = \beta ,$$

where α, β, A_0 are complex constants and

(9) $$q_i^*(x) = \begin{cases} 0 & \text{for } \varphi_i(1)<x<1 \\ q_i(\psi_i(x))\psi_i'(x) & \text{for } 0\leq x\leq\varphi_i(1) \end{cases} \qquad i=\overline{1,m}.$$

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The solutions $y(x,\lambda)$ of (6), (7) and $z(x,\lambda)$ of (6*), (8*) exist, are unique and are entire functions in λ. The eigenvalues of (A) and (A*) are identical and are the A_0-points of

(10) $$\omega(\lambda) = \beta y(1,\lambda) + \int_0^1 y(x,\lambda)\, d\, b(x).$$

For all λ, μ it holds

(11) $$\int_0^1 y(x,\lambda) z(x,\mu)\, dx = \frac{\omega(\lambda)-\omega(\mu)}{\lambda-\mu}.$$

To every zero λ_n of $\omega(\lambda)-A_0$ two systems of functions

(12) $$\left.\frac{\partial^j y(x,\lambda)}{\partial\lambda^j}\right|_{\lambda=\lambda_n} \qquad (j=0,1,\ldots,p_n-1)$$

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(12*) $$\sum_{k=0}^{p_n-j-1} \frac{b^{(n)}_{p_n-j-k-1}}{k!\,j!} \frac{\partial^k z(x,\lambda)}{\partial\lambda^k}\bigg|_{\lambda=\lambda_n} \qquad (j=0,1,\ldots,p_n-1)$$

are adjoint, where p_n is the multiplicity of the zero x and

(13) $$b_k^{(n)} = \frac{1}{k!}\frac{d}{d\lambda^k}\left\{\frac{(\lambda-\lambda)^{p_n}}{\omega(\lambda)-A_o}\right\}_{\lambda=\lambda_n} \qquad (k=0,1,\ldots,p_n-1) .$$

Let

(14) $$|\lambda_o| = \min_{\omega(\lambda_n)=A_o} |\lambda| \quad (\omega(\lambda_o) = A_o) ,$$

(15) $$y_o(x) = y(x,\lambda_o), \quad z_o(x) = \sum_{k=0}^{p_o-1} \frac{b^{(o)}_{p_o-k-1}}{k!} \frac{\partial^k z(x,\lambda)}{\partial\lambda^k}\bigg|_{\lambda=\lambda_o} .$$

The remaining functions (12) and (12*) are numbered in the sequence of

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non-decreasing $|\lambda_n|$ so that each two j-th functions get equal numbers: for Im $\lambda_n \geqslant 0$ positive ones and for Im $\lambda_m < 0$ negative ones. Let

(16) $\{y_k(x),\ z_k(x)\}$ $(k=0,\ \pm 1,\ \pm 2, \ldots)$

be the obtained system of functions. On $[0,1]$ it holds

(17) $$\int_0^1 y_k(x) z_p(x) dx = \begin{cases} 0, & k \neq p, \\ 1, & k = p. \end{cases}$$

Thus it is natural to denote the problems (A) and (A*) to be dual-adjoint. Let the functions $q_i(x)/\Delta_j^!(x)$ $(i,j = \overline{1,m})$ be of bounded variation on $[0,1]$; let $K(x,t)$ be of bounded variation on $[0,1]$ with respect to one argument and uniformly with respect to the other argument (for $t > x$ let $K(x,t) \equiv 0$). Let

(18) $\alpha \beta A_0 \neq 0.$

In this case all eigenvalues of (A) and (A*) lie in the strip

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$\sigma_1 \leq \mathrm{Re}\,\lambda \leq \sigma_2$ $(\sigma_1 \leq \log |A_0|/|\alpha\beta| \leq \sigma_2)$. Let

$$a(x) = a_1(x)+a_2(x)+a_3(x),$$

(19) $$b(x) = b_1(x)+b_2(x)+b_3(x),$$

where $a_1(x)$, $b_1(x)$ are absolutely continuous; $a_2(x)$, $b_2(x)$ are jump functions; $a_3(x)$, $b_3(x)$ are singular functions. Let

(20) $$A = \overset{1}{\underset{0}{V}}(a_2+a_3), \quad B = \overset{1}{\underset{0}{V}}(b_2+b_3).$$

Theorem 1: Let

(21) $$|\beta|A+|\alpha|B+AB \leq \min\{|A_0|, |\alpha\beta|\}.$$

If $f(x) \in L_2(0,1)$, then it holds

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(22)
$$\lim_{n\to\infty}\int_0^1\left|f(x)-\sum_{k=-n}^{n}y_k(x)\int_0^1 f(t)z_k(t)dt\right|^2dx =$$
$$= \lim_{n\to\infty}\int_0^1\left|f(x)-\sum_{k=-n}^{n}z_k(x)\int_0^1 f(t)y_k(t)dt\right|^2dx = 0.$$

Theorem 2 contains conditions under which

(23)
$$\frac{1}{2}\left[f(x+0)+f(x-0)\right] = \sum_{k=-\infty}^{\infty}y_k(x)\int_0^1 f(t)z_k(t)dt$$

and

(25)
$$\lim_{n\to\infty}\left\{\sum_{k=-n}^{n}y_k(x)\int_0^1 f(t)z_k(t)dt-\frac{1}{\pi}\int_0^1 f(t)\frac{\sin\frac{2\pi n}{1}(x-t)}{x-t}dt\right\} = 0$$

are valid.

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Finally it is stated: If (21) is satisfied, then all zeros of $\omega(\lambda)-A_0$ being sufficiently large with respect to the absolute value, are simple.

The author thanks M.M.Dzhrbashyan, Academician of the Academy of Sciences Armyanskaya SSR, for the leading of the work. There is 1 Soviet reference.

ASSOCIATION: Institut matematiki i mekhaniki Akademii nauk Arm.SSR (Institute of Mathematics and Mechanics of the Academy of Sciences Armyanskaya SSR)

PRESENTED: June 29, 1960, by I.N.Vekua, Academician

SUBMITTED: June 23, 1960

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NERSESYAN, A. B., Cand. Phys-Math. Sci. (diss) "Analyses on the Proper Functions of Some Tasks for Differential Equations with Laggin Argument." Yerevan, 1961, 8 pp (Institute of Math. and Mechanics, Acad. of Sci. Armenian SSR, Yerevan State Univ.) 260 copies (KL Supp 12-61, 252).

S/199/61/002/003/004/005
B112/B203

AUTHOR: Nersesyan, A. B.

TITLE: Expansion with respect to eigenfunctions of certain non-self-adjoint boundary problems

PERIODICAL: Sibirskiy matematicheskiy zhurnal, v. 2, no. 3, 1961, 428-453

TEXT: At first, the author studies the two reciprocally adjoint eigenvalue problems:

$$(A)\begin{cases} Ly \equiv \frac{d}{dx}(y(x)-b(x)) + \sum_{i=1}^{m} q_i(x)\, y(x-\Delta_i(x)) + \\ \qquad + \int_0^x K(x,t)\, y(t)\, dt = \lambda y(x); \\ y(0)=\alpha; \\ \beta y(l) + \int_0^l y(x)\, db(x) = A_0. \end{cases}$$

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and

$$(A^*)\begin{cases} L^*z \equiv -\frac{d}{dx}\{z(x)+b(x)\} + \sum_{i=1}^{m} q_i^*(x)\,z(x+\Delta_i^*(x)) + \\ + \int_x^l K(t, x)\,z(t)\,dt = \lambda z(x); \\ \alpha z(0) + \int_0^l z(x)\,da(x) = A_0; \\ z(l) = \beta, \end{cases}$$

where $\Delta_i(1) \leqslant 1$, $\Delta_i'(x) \leqslant \theta < 1$ $(0 \leqslant x \leqslant 1,\ i = 1, 2, \ldots, m)$, $q_i'(x) \in L_1(0,1)$ $q_i(x) \equiv 0$ for $x - \Delta_i(x) < 0$ and

$$\int_0^1 \int_t^1 |K(x,t)|\,dx\,dt < +\infty.$$

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Furthermore,

$$q_i^*(x) = \begin{cases} 0 \text{ for } \varphi_i(1) < x < 1 \\ q_i(\psi_i(x))\psi'(x) \text{ for } 0 \leqslant x \leqslant \varphi_i(1), \end{cases}$$

$\varphi_i(x) \equiv x - \Delta_i(x)$, $\psi_i(x) \equiv \varphi_i^{-1}(x) \equiv x + \Delta_i^*(x)$. The author constructs a biorthogonal function system $\{Y_k(x), Z_k(x)\}$ for (A) and (A*) which is composed of the properly numbered functions

$$\left.\frac{\partial^j y(x,\lambda)}{\partial\lambda^j}\right|_{\lambda=\lambda_n}, \quad \sum_{k=0}^{p_n-j-1} \left.\frac{b^{(n)}_{p_n-j-k-1}}{k!\,j!}\frac{\partial^k z(x,\lambda)}{\partial\lambda^k}\right|_{\lambda=\lambda_n} \quad (j = 0, 1, \ldots, p_n - 1),$$

where

$$b_k^{(n)} = \frac{1}{k!}\frac{d^k}{d\lambda^k}\left\{\frac{(\lambda-\lambda_n)^{p_n}}{\omega(\lambda) - A_0}\right\}_{\lambda=\lambda_n} \quad (k = 0, 1, \ldots, p_n - 1).$$

$\omega(\lambda) \equiv \beta y(1,\lambda) + \int_0^1 y(x,\lambda)db(x)$, and λ_n are the zeros of $\omega(\lambda) - A_0$ and p_n their multiplicities. The author derives, after some lemmas, a number of

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expansion theorems for the function system $\{Y_k(x), Z_k(x)\}$, particularly a generalized Parseval equation. There are 6 references: 3 Soviet-bloc and 3 non-Soviet-bloc. The most important references to English-language publications read as follows: Verblunsky S., On an expansion in exponential series, Quart. J. Math. 7, No. 27 (1956), 231-240., Verblunsky S., On a class of integral functions, Quart. J. Math. 8, No. 32 (1957), 312-320.

SUBMITTED: June 23, 1960

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DZHRBASHYAN, M.M.; NERSESYAN, A.B. (Yerevan)

Expansions by certain biorthogonal systems and boundary value problems for fractional differential equations. Trudy Mosk. mat. ob-va 10:89-179 '61. (MIRA 14:9)

(Boundary value problems) (Series, Orthogonal)
(Differential equations)

NERSESYAN, A.B.

On a problem of eigenvalues. Dokl. AN Arm. SSR 33 no.3:97-103 '61. (MIRA 14:12)

1. Institut matematiki i mekhaniki Akademii nauk Armyanskoy SSR. Predstavleno akademikom AN Armyanskoy SSR M.M. Dzhrbashyanom. (Eigenvalues)

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S/022/62/015/002/001/009
D218/D302

AUTHOR: Nersesyan, A.B.

TITLE: On one class of trigonometric biorthogonal symptoms

PERIODICAL: Akademiya nauk Armyanskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, v. 15, no. 2, 1962, 69 - 80

TEXT: The biorthogonal systems discussed in this paper are of importance in eigenvalue problems which are a generalization of the Sturm-Liouville problem for a finite interval. The results reported by M.M. Dzhrbashyan and the author are employed to show how the functions

$$y(x, \lambda) = \alpha \cos\sqrt{\lambda}\, x + \int_0^x \cos\sqrt{\lambda}\,(x - t)\, da(t) \quad (0 \leqslant x \leqslant l), \tag{1}$$

and

$$z(x, \lambda) = \beta \cos\sqrt{\lambda}\,(l - t) + \int_x^l \cos\sqrt{\lambda}\,(t - x)\, db(t) \quad (0 \leqslant x \leqslant l), \tag{2}$$

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can be used to set up the system

$$\{y_k(x), \ z_k(x)\}_1^{+\infty} \tag{5}$$

which is biorthogonal in (0, 1). It is shown further that the following expansions hold for any function f(x) which is differentiable in (0, 1):

$$f(x) = \sum_{k=1}^{\infty} y_k(x) \int_0^1 f(t) z_k(t) \, dt, \tag{41}$$

$$f(x) = \sum_{k=1}^{\infty} z_k(x) \int_0^1 f(t) y_k(t) \, dt. \tag{42}$$

The series on the R.H.S. of the above two expressions converge uniformly in $x \in (0, 1)$. Hammersley's Theorem 2 can be simply derived from the latter result. There are 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: J.M. Hammersley, Acta Math., 89, 1953, 243-260.

On one class of trigonometric ... S/022/62/015/002/001/009
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ASSOCIATION: Institut matematiki i mekhaniki AN Armyanskoy SSR (Institute of Mathematics and Mechanics, AS Armenian SSR)

SUBMITTED: October 10, 1961

Card 3/3

NERSESYAN, A.B.

Some boundary value problems for equations of the neutral type. Trudy Sem. po teor. diff. urav. s otklon. arg. 2:118-135 '63. (MIRA 18:2)