VILENKIN, M. Ya.

Apparatus for exposing liquids to ultra-violet rays and subjecting them to the action of ionized air. M. Ya. Vilenkin. Russ. 25,662, Mar. 31, 1932. A container made of electrically conducting material is equipped with a source of ultra-violet rays and with helical troughs through which a liquid is passed. Air is passed through the interior simultaneously with the liquid (through troughs), so that both the air and the liquid are exposed to the action of the ultra-violet rays.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

VILENKIN, A.

KLIMOV, K.; VILENKIN, A.

Requirements for viscosity-temperature characteristics of transmission oils. Avt.transp. 35 no.9:13-14 S '57. (MIRA 10:10)
(Automobiles--Librication)

VILENKIN, A.V.

KLIMOV, K.I.; VILENKIN, A.V.

Losses of energy during the initial operation of transmission devices at low temperatures. Avt.i trakt.prom. no.7:24-26 Jl '57. (MIRA 10:11)

(Automobiles--Cold weather operation) (Automobiles--Transmission devices)

VILENKIN, A.V.

AUTHORS: Klimov, K.I. and Vilenkin, A.V. 65-7-7/14

TITLE: The Influence of Physico-chemical Properties of Lubricating Oils on Energy Losses in Gear Transmission (Vliyaniye fiziko-khimicheskikh svoystv smazochnykh masel na poteri energii v shesterenchatoy peredache)

PERIODICAL: Khimiya i Tekhnologiya Topliva i Masel, 1957, No.7, pp. 39-42 (USSR).

ABSTRACT: An investigation of the dependence of energy losses in gear transmissions on the properties of lubricating oils was carried out using various industrial gears as well as models. The oils investigated and their properties are given in the table. Altogether 3 series of experiments were carried out; in the first series, the dependence of energy losses on oil temperature was established using special low r.p.m. gears, and on automobile gears ГАЗ-51; in the second and third series, the relationship between energy losses and oil viscosity at various gear speeds and various loads. The experimental results are shown in graphical forms, Figs. 1-4. It was established that increasing energy losses with decreasing oil temperatures for oils of different chemical composition and produced by different methods are determined only by increases in their viscosity.

Card 1/2

65-7-7/14

The Influence of Physico-chemical Properties of Lubricating Oils on Energy Losses in Gear Transmission

The law of the dependence of energy losses on the viscosity of oil is general for all gear aggregates. It is independent of such factors as geometry of gears, the number of joined pairs of gears, the shape and dimensions of the gearbox, etc. On changes of the above factors, only the absolute value of the energy losses changes. The energy losses in a gear transmission are determined not by whipping of oil nor by its spraying on and swirling, but by the resistance in streams formed during the rotation of gears, i.e. by viscous resistances. In order to decrease the latter, oils of a minimum permissible viscosity (consistent with wear resistance requirements) and a flat temperature-viscosity curve should be used. There are 4 figures and 5 Russian references.

ASSOCIATION: NII GSM (Goryuche-smazochnykh materialov)

AVAILABLE: Library of Congress

Card 2/2

KLIMOV, K.; VINOGRADOV, V.; SENICHKIN, M.; FOMINA, A.; VILENKIN, A.

New oils for automobile transmission units. Avt.transp. 33 no.11: 17-19 N '55. (MLRA 9:3)

(Automobiles--Lubrication)

ROZHKOV, I.V.; KLIMOV, K.I.; KORNILOVA, Ye.N.; VILENKIN, A.V.

Performance characteristics of T-type fuel stabilized by the antioxidant FCh-16. Khim.i tekh.topl. i masel 5 no. 11:49-53 N '60. (MIRA 13:11)

(Jet planes--Fuel) (Petroleum--Refining)

S/081/62/000/006/096/117
B162/B101

11.1700

AUTHORS: Klimov, K. I., Vilenkin, A. V., Kichkin, G. I.

TITLE: New method of evaluating the effectiveness of anti-seizing additives to oils and fuels

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 6, 1962, 546, abstract 6M297 (Sb. "Prisadki k maslam i toplivam", M., Gostoptekhizdat, 1961, 273-278)

TEXT: To evaluate the anti-seizing properties of lubricating materials, a new design of friction machine is developed, simulating the operating conditions of a friction couple in real mechanisms in respect of slip speed (0.5-30 m/sec), temperature (up to 200°C), and periodicity of contact in a wide range of variations (a diagram of the friction machine KB-1 (KV-1) is given). A method is proposed for a comparative evaluation of the anti-seizing properties of lubricating materials and other petroleum products (e.g., jet fuels). The anti-seizing properties of some petroleum products are investigated in the pure state and with additives. It is shown that the device and method of evaluation proposed are characterized by high sensitivity. [Abstracter's note: Complete translation.]

L 12399-63 EWP(j)/EPF(c)/EWT(m)/BDS AFFTC/APGC Pc-4/Pr-4 RM/RM/WW/MN

ACCESSION NR: AP3001670 S/0065/63/000/006/0060/0065

76

75

AUTHOR: Kichkin, G. I.; Rozhkov, I. V.; Vilenkin, A. V.; Kornilova, Ye. N.

TITLE: Effect of additives on anti-wear properties of fuels

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 6, 1963, 60-65

TOPIC TAGS: additives, anti-wear, fuels; anti-oxidants, dispersant stabilizers, metal deactivator, surface-active additives

ABSTRACT: The anti-wear properties of fuels T-1 and TC-1 (naphtha-kerosene fraction) and T-2 (naphtha-kerosene-benzene fraction) were investigated. T-1 showed best and T-2 the worst anti-wear properties; increasing temperature from 20 to 150 degrees noticeably reduced the anti-wear properties. Addition of small amount (0.01% by weight) of antiwear additives (s-organic compounds, or thiophosphoric acid esters) developed for oils, increased anti-wear properties of the fuels to the same extent as the addition of anti-oxidants and dispersant stabilizers. A metal deactivator showed very little surface-active effect, but surface active phenols or phenylenediamine improved fuel stability

Card 1/2

L 12399-63

ACCESSION NR: AP3001670

and increased anti-wear property. "K. I. Klimov was one of the supervisors at the start of the work." Orig. art. has: 3 figures and 3 tables.

ASSOCIATION: none

SUBMITTED: 00	DATE ACQ: 08Jul63	ENCL: 00
SUB CODE: none	NO REF SOV: 007	OTHER: 003

Card 2/2

VILENKIN, A.

VINOGRADOV, V.; KUZNETSOV. Ye.; VILENKIN, A.

Improve the quality of automobile transmission oils. Avt. transp. 33 no.1:16-17 Ja'55. (MLRA 8:3)
(Automobiles--Lubrication)

KICHKIN, Grigoriy Igant'yevich; VILENKIN, Aleksey Vladimirovich; LEVINA, Ye.S., ved. red.; POLOSINA, A.S., tekhn. red.

[Oils for the hydromechanical transmissions of motor vehicles and of wheeled and crawler tractors] Masla dlia gidromekhanicheskikh transmissii avtomobilei i traktorov (kolesnykh i gusenichnykh). Moskva, Gostoptekhizdat, 1963. 142 p. (MIRA 16:8)

(Motor vehicles--Lubrication)
(Tractors--Lubrication)

L 15249-66 EWT(m)/EWP(j)/T DJ/RM

ACC NR: AP6001382 (A) SOURCE CODE: UR/0065/65/000/012/0044/0047

AUTHORS: Sharapov, V. I.; Vilenkin, A. V.; Kichkin, G. I.

ORG: none

45
B

TITLE: Influence of polyisobutylene on the wear-resistant properties of an oil base

SOURCE: Khimiya i tekhnologiya topliv i masel, n. 12, 1965, 44-47

TOPIC TAGS: lubricant, lubricant additive, polyisobutylene, organic lubricant

ABSTRACT: The effect of polyisobutylene additive on the wear-resistant properties of a number of lubricating oils was studied. The experimental technique employed is described by K. I. Klimov and A. V. Vilenkin, (Avtor. svid. No. 121967). The dependence of the critical load on the concentration of polyisobutylene, the effect of the molecular weight of the polyisobutylene on the wear-resistant properties of the oils, and the temperature dependence of the latter were studied. The experimental results are presented in graphs and tables (see Fig. 1). It was found that the addition of polyisobutylene improved the lubricating properties of the oils, the effect being more pronounced the lower the molecular weight of the additive. The protective action of polyisobutylene decreased with increasing temperature. It is suggested that the additive improves the lubricating properties of the oil by forming a protective film on the frictional surface.

Card 1/2

UDC: 541.6:66.022.37:665.521.5

2

L 15249-66

ACC NR: AP6001882

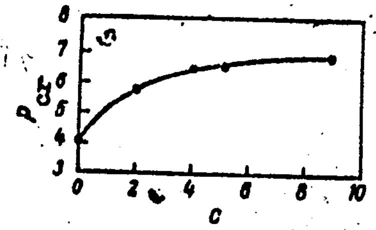

Fig. 1. Dependence of critical load (P_{cr}, kg) on the concentration of polyisobutylene in the oil (C, %).

Orig. art. has: 2 tables and 4 graphs.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 008/ OTH REF: 004

Card 2/2

VILENKIN, A.V.

Some trends in the development of automobile transmission oils in the U.S.A. Khim.i tekh.topl.i masel 4 no.2:63-65 F '59. (MIRA 12:2)

(United States--Lubrication and lubricants)

S/262/62/000/010/014/024
I007/I207

AUTHORS: Klimov, K. I., Vilenkin, A. V. and Kichkin, G. I.

TITLE: A new method of estimating the efficiency of antiseizing additives to oils and fuels

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 42. Silovyye ustanovki, no. 10, 1962, 68, abstract 42.10.381. In collecton "Prisadki k maslam i toplivam". Moscow, Gostoptekhizdat, 1961, 273–278

TEXT: A basically new design of a friction-type engine with two intersecting cylinders and intermittent contact of friction surfaces has been developed for testing the antiseizing properties of additive-type lubricants. For a comparative analysis of these properties, it is necessary to simulate during the test the field conditions for sliding speed, contact of friction surface and temperature, over a large range of variation of these characteristics. A new method, simulating field conditions, has been devised for testing the antiseizing properties of lube oils; this method has been applied to the study of certain oil products including additive-type oils. It is shown that both the new type of test engine and the test method suggested, ensure a markedly higher test accuracy, in comparison with other methods and apparatus (e.g. the four-ball friction engine). There are 3 figures and 4 references.

[Abstracter's note: Complete translation.]

Card 1/1

L 02193-67 EWT(m)/T DJ/JAJ

ACC NR: AP6032091 (A) SOURCE CODE: UR/0256/66/000/009/0069/0070

AUTHOR: Vilenkin, A. V. (Engineer; Lieutenant Colonel; Candidate of technical sciences); Bessmertnyy, K. I. (Engineer; Lieutenant Colonel); Korolev, V. P. (Engineer; Major)

ORG: none

36
35
B

TITLE: Protective storage of machinery by lubricant additives

SOURCE: Vestnik protivovozdushnoy oborony, no. 9, 1966, 69-70

TOPIC TAGS: lubricant additive, lubricant viscosity, lubricating oil /AKOR-1 additive

ABSTRACT: The AKOR-1 additive is obtained by processing certain low viscosity oils with nitric acid, followed by neutralization with alkali to which stearin has been added. Adding 3—20% of AKOR-1 to any regular lubricating oil will keep machinery free from rust for two to three years. The following percentages are used, according to conditions: 3% for machinery stored in heated places, 5—6% if stored in unheated places, 10% if kept in the open air, and 15—20% if stored in subtropical or coastal areas. The maintenance costs per motorized vehicle are

L 02193-67

ACC NR: AP6032091

reduced by 32 to 46 rubles for five years if AKOR is used. The characteristics of regular oils to which AKOR-1 has been added are described in detail in a pamphlet entitled "Inhibited oils and fuels" (Inhibirovannyye masla i topliva) published by the Central Scientific Research Institute for Technical Information and Economies (Tsentral'nyy nauchno-issledovatel'skiy institut tekhnickeskoy informatsii i ekonomii) of Neftegaz (Coal and gas) in 1964.

SUB CODE: 11, 13/ SUBM DATE: none/

Card 2/2 egk

DAVYDOV, Pavel Semenovich; CHERNYSHEV, Valeriy Olegovich; VORONTSOV, A.Ye., inzh., retsenzent; VILENKIN, B.I., nauchn. red.; BRYTSINA, I.M., red.; KRYAKOVA, D.M., tekhn. red.

[True motion indicator in a ship's radar] Indikator istinnogo dvizheniia sudovykh RLS. Leningrad, Sudpromgiz, 1963. 163 p. (MIRA 17:3)

BERMAN, Yakov Isaakovich; GOL'DIN, Boris Moiseyevich; YAKOVLEV, Vladimir Nikolayevich, kand. tekhn. nauk, retsenzent; VILENKIN, Boris Il'ich, nauchnyy red.; ODOYEVTSEVA, I.G., red.; TSAL, R.K., tekhn. red.

[Adjustment and testing of radar equipment] Nastroika i ispytanie radiolokatsionnoi apparatury. Leningrad, Sudpromgiz, 1962. 322 p. (MIRA 15:7)

(Radar)

RAKOV, Veniamin Israilevich; GOL'DSHTEYN, L.D., retsenzent; VILENKIN, B.I., retsenzent; KOGAN, N.L., nauchnyy red.; NIKITINA, M.I., red.; TSAL, R.K., tekhn. red.

[Radar display units]Indikatornye ustroistva radiolokatsionnykh stantsii. Leningrad, Sudpromgiz, 1962. 531 p. (MIRA 15:10)

(Radar)

VILENKIN, [illegible]

[illegible]gress [illegible] ...
111-112 Ap '65. (MIRA 18:5)

1. Institut biologii yuzhnykh morey AN USSR, Sevastopol'.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810012-6"

VILENKIN, B.Ya.

Interpretation of data of large-scale collections of benthos.
Okeanologiia 5 no.1:128-133 '65. (MIRA 18:4)

1. Institut biologii yuzhnykh morey AN UkrSSR.

SNEGOVSKIY, F.P., kand.tekhn.nauk; POLIDOROV, A.V., inzh.; IL'IN, P.L., inzh.; VILENKIN, D.M., inzh.

Industrial testing of an ore-crushing ball mill with hydrostatic bearings. Vest.mashinostr. 45 no.10:41-42 O '65. (MIRA 18:11)

KHVATOV, Yu.A., inzh.; VILENKIN, D.M., inzh.; KNYAZHITSKIY, Yu.A., inzh.

New durable designs of lining plates for ore grinding mills. Gor. zhur. no.12:31-35 D '63. (MIRA 17:3)

1. Novo-Krivorozhskiy gornoobogatitel'nyy kombinat.

VILENKIN Kh. YA

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.

Azletskiy, S. P. (Sverdlovsk). Sylow Class System and Some Problems of the Theory of Finite Groups. 17

Mention is made of Chunikhin, S. A. There are 2 references, both of them USSR. 17

Andrunakiyevich, V. A. (Moscow). Associative Rings With Minimal Two-sided Ideals. 18

There are 6 references, all of which are English.

Vagner, V. V. (Saratov). Generalized Heaps and Generalized Groups. 18-20

Vilenkin, H. Ya. (Moscow). The Theory of Topological Abelian Groups. 20

Mention is made of Pontryagin, L. S.

Card 7/80

BOLTEANSKI, V.G. [Bolteyanskiy, V.G.] (Moscova); VILENKIN, N.I. (Moscova); IAGLOM, I.M. [Yaglom, I.M.] (Moscova)

Contents of the mathematics course in secondary schools. Gaz mat fiz 14 no.7:382-384 Jl '62.

VILENKIN, Naum Yakovlevich; GORYACHAYA, M.M., red.; PLAKSHE, L.Yu., tekhn. red.

[Method of successive approximations] Metod posledovatel'nykh priblizhenii. Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1961. 63 p. (MIRA 14:9)

(Approximate computation)

VILENKIN, N.Ya.; SHVARTSBURD, S.I. (Moskva)

Teaching limits of variables and of functions in a secondary school.
Mat. v shkole no.1:24-34 Ja-F '61. (MIRA 14:3)
(Calculus —Study and teaching)

[illegible] On direct decompositions of topological [illegible]

limiting the summands to one or another combination of [illegible] should perhaps be noted here [illegible]

[illegible] sequence of LKK groups and if in each of [illegible] is distinguished some open compact subgroup H_n, then the author defines a direct sum G of the groups G_n with respect to [illegible] subgroups H_n by means of the sequences [illegible] for all n and $x_n \in H_n$ for almost all n [illegible] topologized, G is of type LKK [illegible] consisting of those x for which $x_n \in H_n$ for all n is [illegible] compact in G and is "distinguished" by the decomposition [illegible] This leads to a definition of the decomposition of [illegible] with distinguished open compact subgroup H [illegible] of an enumerable set [illegible]

The paper is mainly devoted to [illegible] here, for a fixed prime p, [illegible] sional LKK groups of type P [illegible] It is known that there are four classes [illegible] as $n \to \infty$. It is known that there are four classes [illegible] groups which are of type P and of rank one. The principal [illegible] three [illegible] conditions on a group of type P that are [illegible] being [illegible] to a direct sum of [illegible] of these [illegible] further sharpened by the [illegible]

[illegible] of a regularly stratified group of type P [illegible] A denote an arbitrary subset of the group G [illegible] of all x such that [illegible] the set of [illegible] that the [illegible] on the right [illegible] is indicated [illegible] type P is a direct sum [illegible] regularly stratified.

Another important tool is the concept [illegible] group H. This is defined by the algebra [illegible] $p^n H \cap p^{n+1} G$ [illegible] An early theorem [illegible] two concepts. Theorem 2 is as follows [illegible] H is an open compact subgroup [illegible]

VILENKIN, N.

Vilenkin, N. On direct decompositions of topological groups. II. Rec. Math. [Mat. Sbornik] N.S. 19(61) [illegible] 1946. (Russian. English summary) [illegible]

[illegible] part I the study of necessary and sufficient conditions for decomposability into direct sums of groups of rank one. This more extensive class is defined as follows. An Abelian topological group G is called cosseparable if (1) there exists a complete system of neighborhoods of zero consisting of subgroups of G, (2) every bicompact subgroup of G satisfies an ascending chain condition on its closed subgroups, (3) G is the set-theoretic sum of a countable number of bicompact subgroups $G_1, G_2, \cdots$, (4) an arbitrary set T is open in G if $T \cap G_n$ is open in G_n for every n. A group is called weakly separable if it contains a [illegible] H [illegible] that the factor group $G' = G/H$ is [illegible] is separable in the sense of Krull [J. R[illegible] 184, 19–48 (1942); these Rev. 5, 228] [illegible]

[illegible] versely. Another theorem shows [illegible] separable group is locally compact. [illegible] devoted to an analysis of weakly separable [illegible] author generalizes a theorem of Jacobson [Amer. J. Math. 58, 433–449 (1936)]. [illegible] Zassenhaus [illegible]

Source: Mathematical Reviews, Vol 8 No. 6

VILENKIN, N.

Vilenkin, N. On a class of complete orthonormal systems. Bull. Acad. Sci. URSS. Sér. Math. [Izvestia Akad. Nauk SSSR] 11, 363-400 (1947). (Russian. English summary)

Let G be a compact Abelian group. Then as is well known the members of the character group X of G form a complete system of orthonormal functions on G with respect to the Haar measure on the latter. Consequently they may be used to expand functions on G in "Fourier series" whose terms are constant multiples of these characters. In this paper such expansions are considered in some detail for the special case in which G is zero dimensional and separable. In order to be able to discuss nonabsolute convergence the author introduces a sequential ordering in X. This ordering is related to the group structure of X but depends upon an infinite number of arbitrary choices and so is far from being intrinsic or natural in any sense. A related (nonsequential) ordering in G makes it possible to define functions of bounded variation. Using these notions the author obtains a number of theorems analogous to familiar ones in the classical theory of Fourier series. For example he shows that the Lebesgue constants of his series are $O(\log n)$ and that the series cannot converge to zero everywhere unless all the coefficients are zero. He asserts that by mapping G into the unit interval in a manner described by Freudenthal it is possible to deduce theorems about orthonormal sequences of functions of a real variable from his results.

G. W. Mackey (Cambridge, Mass.)

Source: Mathematical Reviews, 1948, Vol 9, No. 5

VILENKIN, N. YA.

Vilenkin, N. Ya. On the theory of weakly separable [illegible] Mat. Sbornik N.S. 22(64), 135-177 [illegible] (Russian)

The author [illegible] introduced the concept of a weakly separable [illegible] in an earlier paper [Rec. Math. [Mat. Sbornik] N.S. 19(61), 311-340 (1946); these Rev. 8, [illegible]] [illegible] there for definitions of separable [illegible] group (c.g.) and weakly separable group [illegible] section of this paper establishes general theorems [illegible] structure of a topological group G to properties [illegible] subgroup H and corresponding [illegible] G/H. For example, if H and G/H are locally [illegible] and they satisfy the second countability axiom or [illegible] complete in the sense of A. Weil then G has that property. [illegible] Abelian, and H and G/H are completely [illegible] dimensional, so is G.

In § 2 [illegible] established that separable, coseparable and weakly separable groups are complete in the sense of Weil and are completely zero-dimensional, i.e., possess arbitrarily small group neighborhoods. It is proved that a continuous [illegible] mapping of a w.s.g. upon a w.s.g. is an open mapping. The term "correct subgroup" is introduced [illegible] a separable subgroup of a w.s.g. whose associated [illegible] group is a c.g. and it is shown that the sum and [illegible] of two such subgroups is also correct. This and [illegible] results of the section are used to show that a w.s.g. is [illegible] of a countable set of subgroups which satisfy the second countability axiom. Finally, there are some theorems on topological spaces which have an analogous property. In § [illegible] is proved that the character group of a separable [illegible] coseparable [illegible] separable group separable [illegible] weakly separable [illegible] weakly separable. The key [illegible] demonstrated [illegible] is w.s. with character [illegible] then G is isomorphic to the character group of [illegible]

Source: Mathematical Reviews, 1/2 Vol. 1 No. 7

The remainder of the paper is devoted to primary groups associated with some prime p. The following theorems occur in § 4. Theorem 12 asserts that if G is primary and w.s. and if H is a discrete subgroup such that $pH = H$, then H is a direct factor of G; theorem 12* is to similar effect with H open. Theorem 14 [illegible] w.s. and H is a subgroup such that [illegible] H is [illegible] and the direct sum of groups of type [illegible], then H [illegible] factor. Theorem [illegible] every [illegible] G contains an open [illegible] H such that [illegible] is a direct sum of groups of type [illegible] cyclic groups, and [illegible] is a direct sum [illegible] groups [illegible]. Theorem 16: every w.s.g. G contains [illegible] H such that [illegible] H is [illegible] separable. The section closes with some structure theorems on so-called reduced groups [illegible] subgroup [illegible] which $pT = T$. Two universal groups [illegible] constructed [illegible] one of these contains each w.s. [illegible] closed subgroup, the other as factor group.

It is shown that if [illegible] separable and $G = p^{\infty}G$, then the decomposition of G [illegible] direct sum of groups of type p and R_p is unique [illegible] an isomorphism. Next, an extension of earlier results on locally compact groups gives: every regularly stratified primary, weakly separable G, which is not a group of rank one, decomposes into a direct sum of proper subgroups. In the concluding § 7 it is shown by simple examples that (1) if a group is not locally compact, it may be zero-dimensional without being "completely" so, (2) a complete topological group may be zero-dimensional and not have arbitrarily small subgroups, and (3) if a complete topological group does not satisfy the second countability axiom it may have factor groups which are not complete.

L. Zippin (Flushing, N. Y.).

Source: Mathematical Reviews, 1948, Vol 9, No. 9

NYdV

VILENKIN, N. YA.

Vilenkin, N. Ya. Corrections to the paper: "Direct decompositions of topological groups. I." Mat. Sbornik N.S. 22(64), 191–192 (1948). (Russian)

The paper appeared in Rec. Math. [Mat. Sbornik] N.S. 19(61), 85–154 (1946); these Rev. 8, 132.

Source: Mathematical Reviews, Vol 9 No. 9

VILENKIN, N YA

Vilenkin, N. Ya. Investigations on the theory of topological Abelian groups. Uspehi Matem. Nauk (N.S.) 5, no. 2(36), 208-210 (1950). (Russian)

This is an abstract of the author's doctoral dissertation. According to the abstract the results in this dissertation have appeared in other articles of the author [Rec. Math. [Mat. Sbornik] N.S. 19(61), 311-340 (1946); Mat. Sbornik N.S. 22(64), 135-177 (1948); 24(66), 189-226 (1949); Doklady Akad. Nauk SSSR (N.S.) 61, 969-971 (1948); 65, 3-5 (1949); these Rev. 8, 312; 9, 497; 10, 679, 282, 507].

G. W. Mackey (Cambridge, Mass.).

Mathematical Reviews, Vol. 11 No. 10

Vilenkin, N. Ya.

Vilenkin, N. Ya. On the classification of separable and coseparable topological Abelian groups. Mat. Sbornik N.S. 27(69), 85–102 (1950). (Russian)

The author defines an extensive class of groups which admit a theory completely analogous to that of the countable, primary, periodic groups. These are the normal, coseparable primary groups to be discussed. Another, similarly directed class of groups was announced previously by the author [Doklady Akad. Nauk SSSR (N.S.) 61, 969–971 (1948); these Rev. 10, 282]. Let G denote a coseparable primary group associated with a fixed [illegible] notation and definitions as in [illegible] 19 [illegible] 340 (1946) [illegible] 22 64 [illegible] (1948) [illegible] 8 [illegible] descending [illegible] of some countable [illegible] where [illegible] H [illegible] according as α has or has not a predecessor. Let [illegible] denote the set of elements of H of the form [illegible] over H. Let [illegible] denote the intersection of [illegible] of the $p^\alpha H$. Let $_k[H]$ denote the elements of H of order p^k and let $_\infty[H]$ denote the elements of infinite order. A subgroup H of G is called "just-right" (vpolnye pravil'no) if for every transfinite α and every integer n

$$p^{\alpha+n}G \cap p^n H = p^n(p^\alpha G \cap H).$$

Here, if α is of the second kind, $\alpha = \omega\gamma$, then $p^\alpha G = G_\alpha$, and if $\alpha = \omega\gamma + n$, then $p^\alpha G = p^n G_\alpha$. The group G is called normal if G has a subgroup H such that (1) H is open, (2) H is just right, (3) $_\infty[H] = 0$. The need for some restriction on the class of coseparable groups [illegible] the point of view of this work is shown by the author's example of two coseparable nonisomorphic groups G and G' such that the factor groups $G_\alpha/G_{\alpha+1}$ and $G'_\alpha/G'_{\alpha+1}$ are isomorphic for every α [illegible]

I. Zippin (Flushing, N. Y.).

Source [illegible]

Vilenkin, N. Ya

Vilenkin, N. Ya. On the theory of general noncommutative topological groups. [illegible] Nauk SSSR (N.S.) 71, 1013-1015 (1950). (Russian)

A general topological group is a topological group in [illegible] not required to satisfy a [illegible] the author proves that every [illegible] is the quotient of a Hausdorff [illegible] [illegible] Doklady (N.S.) 58, 1573-1575 (1947); these Rev. 9, 326] in which the same theorem was proved for general Abelian topological groups. *G. W. Mackey* (Cambridge, Mass.).

Source: [illegible], 1950, Vol 11, No. 8

... the topology of the character group ...

(Abelian) groups which in the case of topological spaces he credits to Sze-Tsen Hu [J. Math. Pures Appl. ... 28 ... 1872 ...

$A \cap B$ is used ...

(3) if A is bounded ...

... system of ... G has quasi-bounded structure if every bounded set belongs to a bounded ...

relation ... for all ... morphism. Theorem 1 states that α is continuous and ...

VILENKIN, N. YA

Vilenkin, N. Ya. On the determination of the dimension of a compact metric space by means of the ring of continuous functions on it. Uspehi Matem. Nauk (N.S.) 6, no. 5(45), 160–161 (1951). (Russian)

Let X be a compact metric space and let $C(X)$ be the ring of all real-valued continuous functions on X. Then the following two conditions are necessary and sufficient for X to have dimension n. (1) For every $n+1$ functions $\varphi_1, \varphi_2, \cdots, \varphi_{n+1} \epsilon C(X)$ and every $\epsilon > 0$, there exist functions $\xi_1, \xi_2, \cdots, \xi_{n+1} \epsilon C(X)$ such that $\|\varphi_i - \xi_i\| < \epsilon$ $(i = 1, 2, \cdots, n+1)$ and the functions $\xi_1, \xi_2, \cdots, \xi_{n+1}$ are contained in no single maximal ideal of $C(X)$. (2) there exist $f_1, f_2, \cdots, f_n \epsilon C(X)$ and $\delta > 0$ such that if $g_1, g_2, \cdots, g_n \epsilon C(X)$ and $\|f_i - g_i\| < \delta$ $(i = 1, 2, \cdots, n)$, then $g_1, g_2, \cdots, g_n$ lie in a proper closed ideal in $C(X)$. This ring-theoretic characterization of dimension is to be compared with that given by Katětov [Časopis Pěst. Mat. Fys. 75, 1–16 (1950); these Rev. 12, 119].

E. Hewitt (Seattle, Wash.).

Source: Mathematical Reviews, Vol 13 No. 6

VILENKIN, N. YA.

Vilenkin, N. Ya. The theory of characters of topological Abelian groups with boundedness given. Izvestiya Akad. Nauk SSSR. Ser. Mat. 15, 439–462 (1951). (Russian)

This investigate the theor[illegible] character groups of an abelian general topological group [illegible] in which there is [illegible] posed a system of "bounded" sets, as defined by Hu [J. Math. Pures Appl. 28, 287–320 (1949); these Rev. 11, 452]. A class of subsets of G is a basis for this "boundedness" if every bounded subset of G is a subset of at least one of the members of the basis. The subset A of G is called quasi-convex if for every element g of G which is not in A there exists a character χ such that [illegible] for every $a \in A$. If each set of [illegible] convex hull and if each neighborhood of [illegible] basis of the identity of G is replaced by [illegible] one derives from G a generalized topological group G^*. Let H denote the closure of the identity element of G^*. Then the factor group G^*/H is called the reduced group of G. It is shown to be locally quasiconvex and to possess [illegible] quasi-convex boundedness [illegible] more simply [illegible] and [illegible] its reduced [illegible] groups. The [illegible] of the character group X of G neighborhoods $N(A)$ of the character group [illegible] $N(A) = \{\chi \in X, \chi(a) \geq \frac{1}{4}, a \in A\}$, and the neighborhoods of e in G form a basis for boundedness in X.

The author studies involutory groups (groups isomorphic to the character group of their character groups) and gives [illegible] closed subgroups [illegible] involut[illegible] [illegible] bounded [illegible]

L. Zippin (Brooklyn, N. Y.).

Source: Mathematical Reviews, Vol 13 No. [illegible]

Vilenkin, N. Ya.

Vilenkin, N. Ya. On the classification of zero-dimensional locally compact periodic Abelian groups without elements of finite order. Mat. Sbornik N.S. 28(70), 503-536 (1951). (Russian)

This is a detailed paper on a substantial part of the author's extension of the theory of the discrete countable torsion groups. Some of the results were announced in an earlier note [Doklady Akad. Nauk SSSR (N.S.) 61, 969-971 (1948); these Rev. 10, 282] and part are contained in §10 of chapter II of a general expository paper [Uspehi Matem. Nauk (N.S.) 5, no. 4(38), 19-74 (1950); these Rev. 12, 78]. The author uses the principal results and follows the notation of his first paper on the direct factoring of topological groups [Mat. Sbornik N.S. 19(61), 85-154 (1946), these Rev. 8, 132]. The groups dealt with here are zero-dimensional, locally compact abelian groups G (i.e. of type NL in the author's notation), primary (i.e. for some fixed prime p and every ... $p^n g$ converges to the ...

integer n ... with no elements of finite order ... $[G]=0$), and satisfying a condition known as completely proper stratification

$$p^n G \cap \overline{p^{\alpha+n} G} = p^n [\overline{p^{\alpha} G}],$$

for every finite integer n and every transfinite α for which the corresponding subgroups ... of infinite height ... (inductively) defined ...

Source: ... Reviews, Vol ...

VILENKIN, N.Ya.

Vilenkin, N. Ya. On the isomorphism of locally compact zero-dimensional Abelian groups with isomorphic factors. Mat. Sbornik N.S. 29(71), 31-62 (1951). (Russian)

It is proved that the pair $(G:H)$ determined in the paper reviewed above is unique, i.e., if $(G':H')$ is another pair corresponding to the same assigned invariants, then there exists an isomorphism of G onto G' such that H is mapped onto H'. The proof is given, first, for the case that G_* and G'_* are vacuous. The desired theorem then follows from theorem 2 that under the conditions on G there exists a closed subgroup T of G such that $G:H = T:(T \cap H) + G_*:(G_* \cap H)$.

L. Zippin (Flushing, N. Y.).

Source: Mathematical Reviews, Vol. 13 No. 3

Vilenkin, N. Ya.

VILENKIN, N.Ya.; YAGLOM, I.M. (Moskva)

Teaching mathematics in teachers' institutes. Mat. v shkole no.2:45-47 Mr-Ap '56. (MLRA 9:6)
(Mathematics--Study and teaching)

CARD 1/1 PG - 748

SUBJECT USSR/MATHEMATICS/Algebra
AUTHOR VILENKIN N.Ja
TITLE On a class of locally compact zero-dimensional topological groups.
PERIODICAL Mat.Sbornik,n.Ser. 40, 479-496 (1956)
reviewed 5/1957

In his earlier papers (Mat.Sbornik,n.Ser. 28, 503-536; ibid. 29, 13-30; ibid. 29, 31-62; ibid. 33, 37-44) the author has generalized the results of Ulm to a class of locally compact zero-dimensional topological Abelian groups. In the present paper the author gives the results being dual to these results. There appears a class of groups which is dual to the earlier one. It is proved that both classes are special cases of a class of topological groups. To these latter one there belong, among others, all direct sums of the groups of rank 1 which have already been treated by the author (Mat.Sbornik,n,Ser. 19, 85-154 (1946)). For these groups the Ulm's factors are determined, they are direct sums of groups of rank 1. Therewith a certain system of numerical invariants is established. The question for the existence and uniqueness of a group with given invariants is not treated.

INSTITUTION: Moscow.

VILENKIN, N.Ya.

Theory of adjoined spherical functions. Dokl.AN SSSR 111 no.4:742-744 D '56. (MLRA 10:2)

1. Voyenno-inzhenernaya akademiya imeni V.V.Kuybysheva. Predstavleno akademikom A.N.Kolmogorovym.
(Functional analysis) (Groups, Theory of)

VILENKIN, N. Ya.

3

Matricheskie Elementy Neprivodimykh Unitarnykh Predstavlenii Gruppy Veshchestvennykh Ortogonal'nykh Matrits i Gruppy Dvizhenii (n-1)-mernogo Evklidova Prostranstva. N. Ia. Vilenkin. AN SSSR Dokl., Mar. 1, 1957, pp. 16-19. In Russian. Discussion of the matrix elements of irreducible unitary representations of the group of real orthogonal matrices and the group of Euclidean (n-1) dimensional space motions

16

VILENKIN, N.Ya.

CARD 1/1 PG - 873

SUBJECT USSR/MATHEMATICS/Algebra
AUTHOR VILENKIN N.Ja, AKIM E.L., LEVIN A.A.
TITLE Matrix elements of irreducible unitary representations of the group of Euclidean motions of a three-dimensional space and their properties.
PERIODICAL Doklady Akad. Nauk 112, 987-989 (1957)
reviewed 6/1957

At the Third Mathematical Union Congress Radov has presented an adress on the computation of the matrix elements of the irreducible unitary representations of the group M(3,R) of the Euclidean motions of a three-dimensional space. The authors carry out the computation of the same elements with the aid of an integral method. Here certain functions are appearing which satisfy certain relations which can be denoted as generalizations of well-known relations between Bessel functions. The authors give a theorem of addition and recurrence formulas for these functions which originate in it.

INSTITUTION: Military Engineer Academy.

VILENKIN, N.Ya.; GORIN, Ye.A.; KOSTYUCHENKO, A.G.; KRASNOSEL'SKIY, M.A.; KREYN, S.G.; MASLOV, V.P.; MITYAGIN, B.S.; PETUNIN, Yu.I.; RUTITSKIY, Ya.B.; SOBOLEV, V.I.; STETSENKO, V.Ya.; FADDEYEV, L.D.; TSITLANADZE, E.S.; LYUSTERNIK, L.A., red.; YANPOL'SKIY, A.R., red.; GAPOSHKIN, V.F., red.

[Functional analysis] Funktsional'nyi analiz. [By] N.IA. Vilenkin i dr. Moskva, Izd-vo "Nauka," 1964. 424 p. (MIRA 17:6)

VILENKIN, N.Ya. (Moskva)

Polyspherical and orispherical functions. Mat. sbor. 68 no.3:432-443 N '65. (MIRA 18:11)

L 5086-66 EWT(d) IJP(c)

ACCESSION NR: AT5024115 UR/2136/65/000/838/0001/0021

AUTHOR: Vilenkin, N. Ya.; Kuznetsov, G. I.; Smorodinskiy, Ya. A.

TITLE: Eigenfunctions of the Laplacian realizing the representation of the groups U(2), SU(2), SO(3), U(3), and SU(3), and the symbolic method

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-838, 1965. Sobstvennyye funktsii operatora Laplasa, realizuyushchiye predstavleniya grupp U(2), SU(2), SO(3), U(3), SU(3) i simvolicheskiy metod, 1-21

TOPIC TAGS: Laplace operator, characteristic function, function analysis, group theory

ABSTRACT: In order to find the irreducible representations of the groups U(n), in addition to the abstract-operative method, it is also possible to use the method employed by N. Ya. Vilenkin and Ya. A. Smorodinskiy (ZhETF, 46, 1793, (1964)). This method is based on the utilization of the Laplacian acting in the space of s_6 -homogeneous polynomials of the $6\pi_4$ degree. The solution obtained is used for the realization of the representation of the groups U(2), SU(2), SO(3), U(3), and SU(3). "The authors thank Yu. A. Danilov for his interest in the work and for discussions." Orig. art. has: 4 figures, 59 formulas, and an appendix with 10 formulas.

Card 1/2

L 5086-66 6

ACCESSION NR: AT5024115

ASSOCIATION: Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii SSSR (State Committee for the Utilization of Atomic Energy SSSR); Institut atomnoy energii im. I.V. Kurchatova (Institute of Atomic Energy)

SUBMITTED: 00 ENCL: 00 SUB CODE: MA

NO REF SOV: 006 OTHER: 002

Card 2/2

VILENKIN, N.Ya. (Moskva); TSUKERMAN, V.V. (Moskva)

An asymptotic formula for the Bessel function. Zhur. v:ch. mat. i mat. fiz. 4 no.6:1097-1102 N-D '64. (MIRA 18:2)

VILENKIN, N.Ya. (Moskva)

Continuous addition theorems for a hypergeometric function.
Mat. Sbor. 65 no.1:28-46 S '64. (MIRA 17:11)

VILENKIN, N.Ya.

Hypergeometric function and the representations of a group of real matrices of second order. Dokl. AN Azerb. SSR 19 no.7:3-7 '63. (MIRA 17:12)

1. Moskovskiy gosudarstvennyy zaochnyy pedagogicheskiy institut.

VILENKIN, N.Ya.; AGAYEV, G.N.; DZHAFARLI, G.M.

Theory of multiplicative orthonormalized systems of functions. Dokl. AN Azerb. SSR 18 no.9:3-7 '62. (MIRA 17:1)

1. Institut matematiki i mekhaniki AN AzerbSSR. Predstavleno akademikom AN Azerbaydzhanskoy SSR Z.I. Khalilovym.

VILENKIN, N.Ya.

Special functions related to representations of class 1 of groups of motions of spaces of constant curvature. Trudy Mosk. mat. ob-va 12:185-257 '63. (MIRA 16:11)

VILENKIN, N.Ya., doktor fiz.-matem.nauk

Innumerable infinities. Znan.-sila 38 no.3:28-31 Mr '63.
(MIRA 16:10)

POL'SKIY, N.I.; GOKHBERG, I.TS.; DYNIN, A.S.; SOLOMYAK, M.Z.; VILENKIN, N.Ya.;
BRODSKIY, M.L.; SKLYARENKO, Ye.G.

Summaries of papers accepted for publication by the Moscow Mathematical Society. Usp. mat. nauk 18 no.2:179-188 Mr-Ap '63. (MIRA 16:8)

(Moscow--Mathematical societies)

GEL'FAND, Izrail' Moiseyevich; GRAYEV, M.I.; VILENKIN, N.Ya.

[Integral geometry and problems of the theory of representations related to it] Integral'naia geometriia i sviazannye s nei voprosy teorii predstavlenii. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1962. 656 p. (MIRA 16:8)

(Geometry, Differential)

GEL'FAND, Izrail' Moiseyevich; GRAYEV, Mark Iosifovich; VILENKIN, Naum Yakovlevich; SHIROKOV, F.V., red.; KRYCHKOVA, V.N., tekhn.red.

[Integral geometry and problems of the theory of representations connected with it] Integral'naia geometriia i sviazannye s nei voprosy teorii predstavlenii. Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1962. 656 p. (Obobshchennye funktsii, no.5). (MIRA 16:2)

(Geometry, Modern) (Functional aanalysis)

38873

S/044/62/000/002/055/092
C111/C222

16.4100

AUTHOR: Vilenkin, N. Ya.

TITLE: On approximation calculations of multiple integrals

PERIODICAL: Referativnyy zhurnal, Matematika, no. 2, 1962, 44-45, abstract 2V241. ("Vychisl. matematika," sb. 5, 1959, 56-71)

TEXT: The author obtains a number of new cubature formulas of the type

$$\int_G f(X)\, p(X)\, dX = \sum_{s=1}^{m} A_s f(X_s),$$

where $p(X)$ is a non-negative weight function with momentums of arbitrary order (i. e., all the integrals $\int X^k p(X) dX$ converge absolutely); $\{X_s\}$ -- point system in n-dimensional space; A_s -- numerical coefficients; G-- certain domain (possibly unbounded) in n-dimensional space. Cartesian as well as spherical coordinates are used. The bibliography contains eleven titles.

[Abstracter's note: Complete translation.]

Card 1/1

GEL'FAND, Izrail' Moiseyevich; VILENKIN, Naum Yakovlevich; SHIROKOV, F.V., red.; YERMAKOVA, Ye.A., tekhn.red.

[Some applications of harmonic analysis. "Fitted" Hilbert spaces] Nekotorye primeneniia garmonicheskogo analiza. Osnashchennye gil'bertovy prostranstva. Moskva, Gos.izd-vo fiziko-mat. lit-ry, 1961. 472 p. (Obobshchennye funktsii, no.4). (MIRA 14:8)
(Harmonic analysis) (Hilbert space)

32467

S/044/61/000/010/033/051
C111/C222

16.4100

AUTHOR: Vilenkin, N.Ya.

TITLE: The deduction of some properties of Jacobian polynomials with the aid of the theory of representations of groups

PERIODICAL: Referativnyy zhurnal. Matematika, no. 10, 1961, 80, abstract 10 B 388. ("Uch. zap. Mosk. gos. ped. in-ta", 1957, 108, 59-71)

TEXT: By the consideration of irreducible representations of the group O_3 (group of revolution of the three-dimensional space) the author obtains a number of properties of the functions

$$P^l_{mn}(\mu) = A(1-\mu)^{-(n-m)/2}(1+\mu)^{-(n+m)/2} \times \frac{d^{l-n}}{d\mu^{l-n}}\left[(1-\mu)^{l-m}(1+\mu)^{l+m}\right], \quad (1)$$

where $A = \frac{(-1)^{l-m} i^{n-m}}{2^l (l-m)!} \sqrt{\frac{(l-m)!(l+n)!}{(l+m)!(l-n)!}}$.

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The deduction of some properties ...

The function $P^l_{mn}(\mu)$ is tightly connected with the Jacobian polynomials $J_s^{\alpha\beta}(\mu)$ by the relation

$$P^l_{mn}(\mu) = K(1-\mu)^{\alpha/2}(1+\mu)^{\beta/2} J_s^{\alpha\beta}(\mu) ,$$

where $\alpha = |m-n|$, $\beta = |m+n|$, $s = l - \frac{\alpha+\beta}{2}$, K is a certain constant depending on l, m, n. The author obtains the formula

$$\sum_{m=-l}^{l} e^{-im\varphi} P^l_{mn}(\cos\theta) = [\sin(2l+1)\alpha] / \sin\alpha ,$$

where $\cos\alpha = \cos(\theta/2)\cos(\varphi/2)$. Besides, for the functions $P^l_{mn}(\mu)$ and for the Legendre polynomials, the author obtains a number of integral representations ; an explicit expression and a multiplication formula for the functions $P^l_m(\cos\theta)$ are obtained ; differential relations between the functions $P^l_{mn}(\cos\theta)$ are derived ; a number of interesting relations

Card 2/3

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S/044/61/000/010/033/051
C111/C222

The deduction of some properties ...

between the binomial coefficients is obtained. The author discusses the possibility to establish a theory of the functions $P^{l}_{mn}(\cos\theta)$ without a knowledge of the expression (1).

[Abstracter's note : Complete translation.]

X

Card 3/3

VILENKIN, N.Ya. (Moskva)

Cubature formulas for the calculation of the moments of functions of two variables. Izv. vys. ucheb. zav.; mat. no.4:49-54 '60. (MIRA 13:10)

(Functions of several variables)

S/042/60/015/003/007/016XX
C111/C222

16.4600

AUTHOR: Vilenkin, N.Ya.

TITLE: On the Theory of Positively Defined Generalized Kernels

PERIODICAL: Uspekhi matematicheskikh nauk, 1960, Vol.15, No.3, pp.139-146

TEXT: Let $S_{1/2}^{1/2}$ and $S_{1/2}$ be the spaces defined in (Ref.1). Let $\mathfrak{M}$ be the set of all points $z(z_1,\ldots,z_n)$ with real or purely imaginary coordinates z_k.

Theorem 1: Let F be an even generalized function in $S_{1/2}^{1/2}$. In order that the inequation $(F,\varphi * \varphi^*) \geq 0$ is satisfied for every even function $\varphi(z)$ of $S_{1/2}^{1/2}$, it is necessary and sufficient that F is the Fourier transform of a uniquely determined even positive measure μ given on $\mathfrak{M}$, where the integrals

$$\int_{\mathfrak{M}} e^{-cz^2} d\mu(z)$$ for all $c > 0$ shall converge.

For the proof the theorem in a somewhat changed equivalent version is reduced with the aid of five lemmas to the theorem of Bochner-Schwartz.

Theorem 2: Let F be an even generalized function in the space $S_{1/2}$. In order that for all even functions of this space it holds $(F,\varphi * \varphi^*) \geq 0$ it is

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S/042/60/015/003/007/016XX
C111/C222

On the Theory of Positively Defined Generalized Kernels

necessary and sufficient that F is the Fourier transform of a uniquely determined positive even measure given on $\mathfrak{M}$, where for every $c > 0$ the integral

(10) $$\int_{\mathfrak{M}} (1+|x|^2)^{-p} e^{cy^2} d\mu(z)$$

shall converge for a certain p $(z=x+iy)$.
The author proves the theorem 2" dual with respect to the Fourier transformation, which asserts that for the validity of the inequation $(F, \varphi\bar{\varphi}) \geq 0$, where the even $F \in S^{1/2}$ is given and the even $\varphi(z) \in S^{1/2}$ is arbitrary, it is necessary and sufficient that $(F, \varphi) = \int_{\mathfrak{M}} \varphi(z) d\mu(z)$, where μ is a measure having the property mentioned in theorem 2.
Theorem 3 asserts that the considered even generalized functions for which

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C111/C222

On the Theory of Positively Defined Generalized Kernels

$(F, \varphi * \varphi^*) \geq 0$ for all even $\varphi \in S_{1/2}^{1/2}$ respectively $S_{1/2}$, are identical with such even generalized functions for which the kernel

(13) $\phi(x,y) = \sum F(x_1 \pm y_1, \ldots, x_n \pm y_n)$

is positive definite.

The author mentions I.M.Gel'fand, Sya Do-shin and M.G.Kreyn. He thanks I.M.Gel'fand for the theme. There are 6 references: 5 Soviet and 1 French.

SUBMITTED: November 21, 1958

Card 3/3

83209

S/140/60/000/004/001/006
C111/C333

16.6500

AUTHOR: Vilenkin, N.Ya.

TITLE: Cubature Formulas for the Calculation of the Moments of Functions of two Variables

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, 1960, No. 4, pp. 49-54

TEXT: The author gives the cubature formulas

$$\int_{-1}^{1}\int_{-1}^{1} x^{2k+1} f(x,y)\,dx\,dy \approx \frac{8}{26k+55}\Big[f(1,0)-f(-1,0)\Big]+$$
$$+\frac{32\cdot 2^{1/2}(2k+7)^{3/2}(2k+5)^{1/2}}{9(4k+5)^{1/2}(2k+3)^{3/2}(26k+55)}\left[f\left(\sqrt{\frac{(4k+5)(2k+3)}{2(2k+7)(2k+5)}},0\right)-\right. \qquad (7)$$
$$\left.-f\left(-\sqrt{\frac{(4k+5)(2k+3)}{2(2k+7)(2k+5)}},0\right)\right]+\frac{5(2k+5)^{1/2}}{9(2k+3)^{3/2}}\left[f\left(\sqrt{\frac{2k+3}{2k+5}},\sqrt{\frac{3}{5}}\right)+f\left(\sqrt{\frac{2k+3}{2k+5}},-\sqrt{\frac{3}{5}}\right)-\right.$$
$$\left.-f\left(-\sqrt{\frac{2k+3}{2k+5}},\sqrt{\frac{3}{5}}\right)-f\left(-\sqrt{\frac{2k+3}{2k+5}},-\sqrt{\frac{3}{5}}\right)\right]$$

Card 1/2

83209

S/140/60/000/004/001/006
C111/C333

Cubature Formulas for the Calculation of the Moments of Functions of two Variables

$$\iint\limits_{x^2+y^2\leqslant 1} x^{2k+1} f(x,y)\,dxdy) \cong \frac{(2k+3)!!\pi}{(2k+6)!!}\left\{\frac{2}{5}\left[f(1,0)-f(-1,0)\right] + \right. \qquad (13)$$

$$+\frac{4}{15}\frac{(2k+8)^{3/2}}{(2k+3)^{3/2}}\left[f\left(\sqrt{\frac{2k+3}{2k+8}},0\right)-f\left(-\sqrt{\frac{2k+3}{2k+8}},0\right)\right]+\frac{(2k+8)^{3/2}}{6(2k+3)^{3/2}}\left[f\left(\sqrt{\frac{2k+3}{2k+8}},\sqrt{\frac{3}{2k+8}}\right)+\right.$$

$$\left.\left.+f\left(\sqrt{\frac{2k+3}{2k+8}},-\sqrt{\frac{3}{2k+8}}\right)-f\left(-\sqrt{\frac{2k+3}{2k+8}},\sqrt{\frac{3}{2k+8}}\right)-f\left(-\sqrt{\frac{2k+3}{2k+8}},-\sqrt{\frac{3}{2k+8}}\right)\right]\right\}$$

and a great number of special cases. The formulas (7) and (13) rigorously hold for all polynomials $f(x,y)$ which are of sixth degree in x and y. The error in the calculation of the integral $\int_{-1}^{1}\int_{-1}^{1} x^2\sqrt{2-x^2-y^2}\,dxdy$ with the aid of the given formulas amounts to 0.6%; if the same integral is calculated over the circle $x^2+y^2 \leqslant 1$, then the error is 0.03%.

SUBMITTED: January 30, 1960

Card 2/2

VILENKIN, N.Ya.

Approximate calculation of multiple integrals. Vych. mat. no.5: 58-71 '59. (MIRA 13:3)

(Integrals, Multiple)

67054

16(1) 16.1500 SOV/44-59-9-8826

Translation from: Referativnyy zhurnal.Matematika,1959,Nr 9,p 31 (USSR)

AUTHOR: Vilenkin,N.Ya.

TITLE: On an Estimation of the Maximal Eigenvalue of a Matrix

PERIODICAL: Uch.zap.Mosk.gos.ped.in-ta,1957,108,55-57

ABSTRACT: For an arbitrary quadratic matrix $\| a_{ik} \|^n$ let the sums

$S_i = \sum_{k=1}^{n} |a_{ik}|$ $(i=1,\dots,n)$ be ordered into a decreasing sequence:

$S_{m_1} \geqslant S_{m_2} \geqslant \dots \geqslant S_{m_n}$. Let $j=m_1$, $T_{ik} = S_i - |a_{ik}|$ $(i,k=1,\dots,n)$ and

$$U_r = \begin{cases} \frac{1}{2} T_{rj} + a_{jj} + \sqrt{(T_{rj} - |a_{jj}|)^2 + 4T_{jj}|a_{rj}|}), & \text{for } r \neq j \\ S_{m_2} & \text{for } r = j \end{cases} \quad (r=1,\dots,n)$$

For the absolute values of the eigenvalues λ of the matrix $\| a_{ik} \|$ the following limit is given in the paper:

$$|\lambda| \leqslant \max_r U_r .$$

Remark of the reviewer: In the article the principal formula contains a misprint (instead of a_{rj} read $|a_{rj}|$). F.R.Gantmakher

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VILENKIN, N.Ya.; SHVARTSBURD, S.I. (Moskva)

Some applications of exponential and logarithmic functions.
Mat. v shkole no.5:9-21 S-O '59. (MIRA 13:2)
(Functions, Exponential)

ZHAK, Isaak Yefimovich; VILENKIN, N.Ya., prof., red.; NEMTSOVA, L.G., red.; KORNEYEVA, V.I., tekhn.red.

[Differential calculus; textbook for pedagogical institutes] Differentsial'noe ischislenie; uchebnoe posobie dlia pedagogicheskikh institutov. Pod red. N.IA.Vilenkina. Moskva, Gos. uchebno-pedagog.izd-vo M-va prosv.RSFSR, 1960. 403 p. (MIRA 13:2)

(Calculus, Differential)

VILENKIN, N. YA.

16(0) P.4 PHASE I BOOK EXPLOITATION SOV/3342

Akademiya nauk SSSR. Vychislitel'nyy tsentr

Vychislitel'naya matematika (Computer Mathematics) Moscow, Izd-vo AN SSSR, 1959. 148 p. (Series: Its: Sbornik, 5) Errata slip inserted. 3,200 copies printed.

Resp. Ed.: V. A. Ditkin, Professor; Ed.: M. V. Yakovkin; Tech. Ed.: S. G. Markovich.

PURPOSE: This book is intended for applied mathematicians, scientific workers, engineers and scientists whose work involves computation.

COVERAGE: This book contains 9 articles on problems in computer mathematics. Three articles are devoted to problems of nomography. There are individual articles on the numerical integration of first order ordinary differential equations, the approximate integration of multiple integrals, random values with arbitrary distribution, stochastic processes and the Monte Carlo method,

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and the finding of the original function when its transform is a proper rational fraction. References accompany each article.

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Computer Mathematics

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Murav'yev, P. A. On the Problem of Finding the Original Function When the Transform Is a Proper Rational Fraction 140

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4-26-60

KACHMAZH, S. [Kaczmarz, Stefan]; SHTEINGAUZ, G.; GUTER, R.S. [translator]; UL'YANOV, P.L. [translator]; VILENKIN, N.Ya., red.

[Theory of orthogonal series] Teoriia ortogonal'nykh riadov. Pod red. i s dop. N.IA.Vilenkina. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1958. 507 p. (MIRA 12:11)
(Series, Orthogonal)

BOLTYANSKIY, V.G. (Moskva); VIL [illegible], N.Ya. (Moskva); YAGLOM, I.M. ([illegible]

Mathematics curricul[illegible] for secondary schools. Mat. pros. [illegible] (MIRA [illegible])
159.

(Mathem[illegible]--Study and teaching)

VILENKIN, N. Ya.

16(1) PHASE I BOOK EXPLOITATION SOV/2508

Matematicheskoye prosveshcheniye; matematika, yeye prepodavaniye, prilozheniya i istoriya, vyp. 4 (Mathematical Education; Mathematics, Its Teaching, Application and History, Nr. 4) Moscow, Gostekhizdat, 1959. 15,000 copies printed.

Ed.: I.N. Bronshteyn; Editorial Board of Series: I.N. Bronshteyn, A.I. Markushevich, I.M. Yaglom; Tech. Ed.: S.N. Akhlamov.

PURPOSE: This book is intended for persons without an extensive mathematical education who are interested in trends in contemporary mathematics. The book may be useful to high school mathematics teachers.

COVERAGE: The book consists of articles, reviews, and scientific and methodological reports, some of which are translations from other languages. The state of modern mathematics is covered, including applications, history, teaching of mathematics in schools, and mathematical developments in the USSR and abroad. One section deals with scientific and pedagogical life in the USSR and another contains reviews of certain mathematical publications. Some mathematical background is necessary to understand the book; certain articles require a knowledge of higher mathematics.

TABLE OF CONTENTS:

I. REVIEWS, ARTICLES, TRANSLATIONS

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VILENKIN, N.Ya.

Dot-product properties of group spaces of bicompact commutative groups. Usp.mat.nauk 13 no.6:79-80 N-D '58.
(Groups, Theory of) (MIRA 12:2)

VILENKIN, N.Ya.

One evaluation of maximum eigenvalues of matrices. Uch. zap
MGPI 108:55-57 '57. (MIRA 11:12)
(Matrices) (Eigenvalues)

VILENKIN, N.Ya.

Deducing certain properties of Jacobi's polynomials bb using the theory of representation of groups. Uch. zap MGPI 108:59-71 '57.
(MIRA 11:12)

(Function, Orthogonal) (Groups, Theory of)

VILENKIN, N.Ya.

One F. Hausdorff's theorem. Uch. zap MGPI 108:73-74 '57.
(MIRA 11:12)

(Functional analysis)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810012-6"

AUTHOR: Vilenkin, N.Ya. SOV/42-13-3-5/41

TITLE: Some Relations for the Functions of Gegenbauer (Nekotoryye sootnosheniya dlya funktsiy Gegenbauera)

PERIODICAL: Uspekhi Matematicheskikh Nauk, 1958, Vol 13, Nr 3, pp 167-172 (USSR)

ABSTRACT: The author proves the following relations:

I. $$C_n^p(\cos\lambda) = \frac{2\,\Gamma(2p+n)\,\Gamma(p+\frac{1}{2})\,\Gamma(2t)}{\Gamma(2p)\,\Gamma(p-t)\,\Gamma(n+2t)\,\Gamma(t+\frac{1}{2})}\int\limits_0^{\frac{\pi}{2}} C_n^t\left(\frac{\cos\lambda}{\sqrt{\sin^2\theta+\cos^2\lambda\cos^2\theta}}\right)\times$$

$$\times(\sin^2\theta+\cos^2\lambda\cos^2\theta)^{\frac{n}{2}}\sin^{2t}\theta\,\cos^{2p-2t-1}\theta\,d\theta,$$

where $\mathrm{Re}(p) > \mathrm{Re}(t) > -\frac{1}{2}$.

II.

$$C_{n-k}^{p+k}(\cos\lambda)\sin^k\lambda = \frac{(-2i)^k\,\Gamma(2p-1)\,\Gamma(2p+n+k)\,\Gamma(p+k+\frac{1}{2})k!}{\sqrt{\pi}\,n!\,\Gamma(2p+2k)\,\Gamma(2p+k-1)\,\Gamma(p)}\times$$

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$$\times \int_{0}^{\pi} C_{k}^{p-\frac{1}{2}} (\cos\theta)(\cos\lambda + i \sin\lambda \cos\theta)^{n} \sin^{2p-1}\theta \, d\theta,$$

where $Re(p) > 1$.

III.

$$C_{n}^{p}(\cos\psi\cos\theta + \sin\psi\sin\theta\cos\varphi) = \frac{\Gamma(2p-1)}{[\Gamma(p)]^{2}} \sum_{k=0}^{n} \frac{2^{2k}(n-k)!\,[\Gamma(p+k)]^{2}}{\Gamma(2p+n+k)}(2p+2k-1) \times$$

$$\times \sin^{k}\psi \sin^{k}\theta \, C_{n-k}^{p+k}(\cos\psi) C_{n-k}^{p+k}(\cos\theta) \, C_{k}^{p-\frac{1}{2}}(\cos\varphi).$$

IV.

$$\int_{0}^{\infty} P^{k}_{-\frac{1}{2}+i\lambda}(ch\,\theta) P^{-k}_{-\frac{1}{2}+i\lambda}(ch\,\psi) P_{-\frac{1}{2}+i\lambda}(ch\,\mu)\,\lambda\, th\,\pi\lambda\, d\lambda =$$

$$= \frac{1}{\pi} \frac{T_{k}\left(\frac{ch\,\theta\; ch\,\psi - ch\,\mu}{sh\,\theta\; sh\,\psi}\right)}{\sqrt{[ch(\theta+\psi) - ch\,\mu][ch\,\mu - ch(\theta-\psi)]}} \quad \text{if } |\theta-\psi| \leq \mu \leq \theta+\psi;$$

the integral equals zero if $\mu \geq 0$ and does not belong to this interval. Besides

$$T_n(x) = \cos(n \text{ arc } \cos x),$$

the $p_{-\frac{1}{2}+i\lambda}$ are conic functions.

There are 7 references, 4 of which are Soviet, 2 English and 1 American.

SUBMITTED: January 26, 1957

SOV/42-13-6-7/33

AUTHOR: Vilenkin, N.Ya.

TITLE: On the Diadicity of the Group Space of Bicompact Commutative Groups (O diadichnosti gruppovogo prostranstva bikompaktnykh kommutativnykh grupp)

PERIODICAL: Uspekhi matematicheskikh nauk, 1958, Vol 13, Nr 6, pp 79-80 (USSR)

ABSTRACT: A question given by P.S.Aleksandrov is answered positively by the following theorem:
Let G be a commutative bicompact group. Let D_{τ} be a direct topological product of τ two-pointed Hausdorff spaces. Then there exists a continuous mapping of the space D_{τ} onto G, i.e. G - considered as a topological space - is a diadic bicompactum.
There is 1 Soviet reference.

SUBMITTED: May 6, 1957

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VILENKIN, N.Ya. (Moscow)

Uniform continuity of functions. Mat. pros. no.1:167-168 '57. (MIRA 11:7)

(Functions, Continuous)

AUTHOR: Vilenkin, N.Ya. 20-118-2-2/60

TITLE: Matrix Elements of the Irreducible Unitary Representations a Group of Motionsof the Lobachevskiy Space and Generalized Transformations of Fock - Mehler (Matrichnyye elementy neprivodimykh unitarnykh predstavleniy gruppy dvizheniy prostranstva Lobachevskogo i obobshchennyye preobrazovaniya Foka - Melera)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol 118, Nr 2, pp 219-222 (USSR)

ABSTRACT: Let $\mathfrak{H}$ be the space of those functions $f(\operatorname{ch}\alpha)$ for which the integral

$$\|f\|^2 = \int_0^\infty |f(\operatorname{ch}\alpha)|^2 \operatorname{sh}^{2p+1} \alpha \, d\alpha$$

converges. Let $\mathfrak{R}$ be the space of those functions $F(\mu)$ for which

$$\|F\| = \pi \int_0^\infty \frac{|F(\mu)|^2 \, d\mu}{\mu \operatorname{sh} \pi\mu \, \Gamma(p+i\mu+\frac{1}{2}) \Gamma(p-i\mu+\frac{1}{2})}$$

converges.

Theorem: The formulas

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$$F(\mu) = \frac{\mu \, sh \, \pi\mu}{\pi} \Gamma(p+i\mu+\frac{1}{2}) \Gamma(p-i\mu+\frac{1}{2}) \times$$

$$\times \int_0^\infty f(ch\,\alpha) P^{-p}_{-\frac{1}{2}+i\mu}(ch\,\alpha) sh^{p+1}\alpha \, d\alpha$$

and

$$f(ch\,\alpha) = sh^{-p}\alpha \int_0^\infty F(\mu) P^{-p}_{-\frac{1}{2}+i\mu}(ch\,\alpha) d\mu$$

define a one-to-one mapping of the spaces $\mathcal{G}$ and $\mathcal{R}$ on each other. Here it is $\|f\|^2 = \|F\|^2$, i.e. the mappings are isometric. Concerning the functions $P_{-\frac{1}{2}+i\mu}$ see especially [Ref 5,6].

Several further relations probably not yet known are given.

For functions for which $\int_0^\infty |f\,(ch\,\alpha)|\, sh^{2p+1}\alpha \, d\alpha$ converges the

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a Group of Motions of the Lobachevskiy Space and Generalized Transformations of Fock - Mehler

convolution product is introduced:

$$f_1 * f_2(\mathrm{ch}\,\alpha) = \frac{\Gamma(p+1)}{\Gamma(p+\frac{1}{2})\sqrt{\pi}} \int_0^{\infty}\int_0^{\pi} f_1(\mathrm{ch}\,\beta) f_2(\mathrm{ch}\,\alpha\,\mathrm{ch}\,\beta + \mathrm{sh}\,\alpha\,\mathrm{sh}\,\beta\cos\varphi) \times$$

$$\times \sin^{2p}\varphi\ \mathrm{sh}^{2p+1}\beta\, d\varphi\, d\beta \quad .$$

There are 7 references, 4 of which are Soviet.

ASSOCIATION: Voyenno - inzhenernaya akademiya imeni V.V. Kuybysheva (Military Engineering Academy imeni V.V. Kuybyshev)

PRESENTED: July 9, 1957, by V.A. Fok, Academician

SUBMITTED: June 9, 1957

AVAILABLE: Library of Congress

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VILENKIN, N.Ya.

Certain correlations for Gegenbauer's functions. Usp. mat. nauk 13 no.3:167-172 My-Je '58. (MIRA 11:6)
(Functions)

VILENKIN, N.Ya.

Continual analogue of the summation theorem for Jacobi's polynomials. Usp.mat.nauk 13 no.2:157-161 Mr-Ap '58. (MIRA 11:4)
(Bessel's functions)
(Polynomials)