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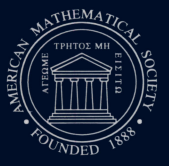
MATHEMATICAL MONOGRAPHS

Volume 126

Invariant Function Spaces on Homogeneous Manifolds of Lie Groups and Applications

M. L. Agranovskiĭ



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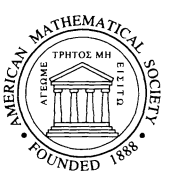

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ИНВАРИАНТНЫЕ ПРОСТРАНСТВА ФУНКЦИЙ НА ОДНОРОДНЫХ МНОГООБРАЗИЯХ ГРУПП ЛИ И ИХ ПРИЛОЖЕНИЯ

Марк Львович Аграновский

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ABSTRACT. The monograph is devoted to the study of translation-invariant function spaces and algebras on homogeneous manifolds: semisimple and nilpotent Lie groups, Riemann symmetric spaces, bounded symmetric domains. Classification of various classes of translation-invariant spaces and algebras is obtained. Applications to characterization problems for holomorphic functions in one and several complex variables and their boundary values are given.

The monograph is directed to specialists in harmonic analysis, function theory, functional analysis, and representation theory of Lie groups.

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To the memory
of my father

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References

1. M. L. Agranovskiĭ, *Invariant algebras on the boundaries of symmetric domains*, Dokl. Akad. Nauk SSSR **197** (1971), no. 1, 9–11; English transl., Soviet Math. Doklady **12** (1971), 371–374.
2. ———, *Invariant algebras on noncompact symmetric Riemannian spaces*, Dokl. Akad. Nauk SSSR **207** (1972), no. 3, 513–516; English transl. in Soviet Math. Doklady **13** (1972).
3. ———, *On antisymmetric algebras of differentiable functions on smooth manifolds*, Sibirsk. Mat. Zh. **18** (1977), no. 2, 455–458; English transl., Siberian Math. J. **18** (1977), 327–331.
4. ———, *Fourier transform on $SL_2(\mathbb{R})$ and Morera type theorems*, Dokl. Akad. Nauk SSSR **243** (1978), no. 6, 1353–1356; English transl., Soviet Math. Doklady **19** (1978), 1522–1525.
5. ———, *Invariant function algebras on homogeneous spaces of nocompact semisimple Lie groups*, Mat. Zametki **28** (1980), no. 5, 645–652; English transl., Math. Notes **28** (1980), 779–783.
6. ———, *Tests for holomorphy in symmetric domains*, Sibirsk. Mat. Zh. **22** (1981), no. 2, 7–18; English transl., Siberian Math. J. **22** (1981), 171–179.
7. ———, *Function spaces in a disk invariant under multiplication by z and conformal translations*, Sibirsk. Mat. Zh. **22** (1981), no. 3, 3–8; English transl. in Siberian Math. J. **22** (1981).
8. ———, *Invariant spaces and traces of holomorphic functions on Shilov boundaries of the classical domains*, Sibirsk. Mat. Zh. **25** (1984), no. 2, 3–12; English transl. in Siberian Math. J. **25** (1984).
9. ———, *Invariant function algebras in symmetric spaces*, Trudy Moskov. Mat. Obshch. **47** (1984), 158–178; English transl. in Trans. Moscow Math. Soc. **47** (1985), 175–197.
10. ———, *Invariant function spaces and algebras on Lie groups and symmetric domains*, Colloquia Math. Soc. Janoš Bolyai (A. Haar Memorial Conf., Budapest, 1985), vol. 49, Akademiai Kiado, Budapest, 1987, pp. 115–126.
11. ———, *Affine-invariant function algebras on the Heisenberg group*, Dokl. Akad. Nauk SSSR **289** (1986), no. 2, 265–268; English transl., Soviet Math. Doklady **34** (1987), 53–56.
12. ———, *Invariant function spaces on the Heisenberg group*, Sibirsk. Mat. Zh. **28** (1987), no. 3, 6–27; English transl., Siberian Math. J. **28** (1987), 358–375.
13. ———, *Poisson integral in Möbius-invariant spaces in the complex ball*, Siberian Math. J. **31** (1990), no. 6; English transl. in Siberian Math. J. **31** (1990).
14. M. L. Agranovskiĭ and A. M. Semenov, *Analyticity on unitarily invariant families of curves in $\mathbb{C}^n$*, Sibirsk. Mat. Zh. **29** (1988), no. 1, 192–196; English transl., Siberian Math. J. **29** (1988), 149–152.
15. ———, *$SU(m, n)$-invariant spaces of holomorphic functions*, Preprint TR90-2, University of Maryland, 1990, pp. 1–24.
16. L. A. Aĭzenberg and A. P. Yuzhakov, *Integral representations and residues in multidimensional complex analysis*, "Nauka", Novosibirsk, 1988; English transl. of the 1st edition, Amer. Math. Soc., Providence, RI, 1983.

17. A. Erdélyi (ed.), *Higher transcendental functions*, McGraw-Hill, New York, 1954.
18. V. S. Vladimirov, *Methods of the theory of function of several complex variables*, "Nauka", Moscow, 1984; English transl. of the 1st edition, MIT Press, Cambridge, MA, 1966.
19. T. W. Gamelin, *Uniform algebras*, Prentice-Hall, Englewood Cliffs, NJ, 1969.
20. D. P. Zhelobenko, *Compact Lie groups and their representations*, "Nauka", Moscow, 1970; English transl., Amer. Math. Soc., Providence, RI, 1973.
21. D. P. Zhelobenko and A. I. Shtern, *Representations of Lie groups*, "Nauka", Moscow, 1983. (Russian)
22. A. A. Kirillov, *Elements of representation theory*, "Nauka", Moscow, 1972; English transl., Springer-Verlag, Berlin and New York, 1976.
23. M. M. Lavrent'ev, V. G. Romanov, and S. P. Shishatskiĭ, *Ill posed problems of mathematical physics and analysis*, "Nauka", Moscow, 1980; English transl., Amer. Math. Soc., Providence, RI, 1986.
24. A. Barut and R. Ronczka, *Theory of group representations and applications*, vol. 2, PWN, Warszawa, 1977.
25. I. I. Pyatetskiĭ-Shapiro, *Geometry of the classical domains and theory of automorphic functions*, "Nauka", Moscow, 1961; English transl., Gordon and Breach, New York, 1969.
26. W. Rudin, *Function theory in the unit ball of* $\mathbb{C}^n$, Springer-Verlag, New York, 1980.
27. G. Szegö, *Orthogonal polynomials*, 3rd edition, Amer. Math. Soc., Providence, RI, 1967.
28. S. Helgason, *Differential geometry and symmetric spaces*, Academic Press, New York, 1962.
29. E. M. Stein and G. Weiss, *Introduction to Fourier analysis on Euclidean spaces*, Princeton Univ. Press, Princeton, NJ, 1971.
30. Hua Lo-ken, *Harmonic analysis of functions of several complex variables in the classical domains*, Princeton Univ. Press, Princeton, NJ, 1963.
31. M. L. Agranovskiĭ and R. E. Val'skiĭ, *Maximality of invariant algebras of functions*, Sibirsk. Mat. Zh. **12** (1971), no. 1, 3–12; English transl., Siberian Math. J. **12** (1971), 1–7.
32. L. A. Aĭzenberg and A. Sh. Dautov, *Holomorphic functions of several complex variables with nonnegative real part. Traces of holomorphic and pluriharmonic functions on the Shilov boundary*, Mat. Sb. **99** (1976), no. 3, 342–355; English transl., Math. USSR-Sb. **28** (1976), 301–313.
33. E. B. Vinberg, S. G. Gindikin, and I. I. Pytetskiĭ-Shapiro, *Classification and canonical realization of complex bounded homogeneous domains*, Trudy Moskov. Mat. Obshch. **12** (1963); English transl. in Trans. Moscow Math. Soc. **12** (1963) 404–437.
34. V. S. Vladimirov, *Holomorphic functions with positive imaginary part in the future tube.* I, Mat. Sb. **93** (1974), 9–17; English transl., Math. USSR-Sb. **22** (1974), 1–16.
35. V. S. Vladimirov and A. G. Sergeev, *Complex analysis in the future tube*, Sovremennye Problemy Matematiki. Fundamental'nye Napravleniya, vol. 8, VINITI, Moscow, 1985, pp. 191–266; English transl. in Encyclopaedia Math. Sci., vol. 8, Springer, Berlin and New York, 1990.
36. I. M. Gel'fand, *On subrings of the ring of continuous functions*, Uspekhi Mat. Nauk **12** (1957), no. 1, 247–251; English transl., Amer. Math. Soc. Transl. Ser. 2 **16** (1960), pp. 477–479.
37. S. G. Gindikin, *Analysis in homogeneous domains*, Uspekhi Mat. Nauk **19** (1964), no. 4, 3–92; English transl. in Russian Math. Surveys **19** (1964).
38. V. M. Gichev, *Invariant function algebras on Lie groups*, Sibirsk. Mat.Zh. **20** (1979), no. 1, 23–36; English transl., Siberian Math. J. **20** (1979), 15–25.
39. ———, *Maximal ideal spaces of invariant algebras*, Funktsional. Anal. i Prilozhen. **13** (1979), no. 3, 73–76; English transl. in Functional Anal. Appl. **13** (1979).
40. ———, *Invariant algebras of continuous functions on balls and Euclidean spaces*, Sibirsk. Mat. Zh. **25** (1984), no. 4, 32–36; English transl., Siberian Math. J. **25** (1984), 534–537.
41. E. A. Gorin, *Commutative Banach algebras generated by a group of unitary elements*, Funktsional. Anal. i Prilozhen **1** (1967), no. 3, 86–87; English transl., Functional Anal. Appl. **1** (1967), 243–244.
42. E. A. Gorin and V. M. Zolotarevskiĭ, *Maximal subalgebras in algebras with involution*, Mat. Sb. **85** (1971), no. 3, 373–387; English transl., Math. USSR-Sb. **14** (1971), 367–382.

43. E. A. Gorin, *On the research of G. E. Shilov in the theory of commutative Banach algebras and its subsequent development*, Uspekhi Mat. Nauk **33** (1978), no. 4, 169–188; English transl., Russian Math. Surveys **33** (1978), 193–217.
44. A. M. Kytmanov, *Holomorphy criterion for integrals of Martinelli-Bochner type*, Combinatorial and Asymptotic Analysis, "Nauka", Krasnoyarsk, 1975, pp. 169–177. (Russian)
45. N. K. Nikolskiĭ, *Invariant subspaces in operator theory and function theory*, Itogi Nauki i Techniki, Matematicheskiĭ Analiz, vol. 12, VINITI, Moscow, 1974, pp. 199–412; English transl. in J. Soviet Math. **5** (1976), no. 1/2.
46. P. K. Rashevskiĭ, *Description of closed invariant subspaces of some function spaces*, Trudy Moskov. Mat. Obshch. **39** (1979), 139–185; English transl. in Proc. Moscow Math. Soc. **1981**, no. 1.
47. G. M. Henkin, *Method of integral representations in complex analysis*, Sovremennye Problemy Matematiki. Fundamental'nye Napravlenuya, vol. 7, VINITI AN SSSR, Moscow, 1985, pp. 23-124; English transl., Encyclopaedia Math. Sci., vol. 7, Springer-Verlag, Berlin and New York, 1989, pp. 19–116.
48. R. O. Wells Jr., *Function theory on differentiable manifolds in* $\mathbb{C}^n$, Contributions to Analysis, Academic Press, New York, 1974, pp. 407–441.
49. E. M. Chirka, *Approximation by holomorphic functions on smooth manifolds in* $\mathbb{C}^n$, Mat. Sb. **78** (1969), no. 1, 101–123; English transl. in Math. USSR-Sb. **7** (1969).
50. G. E. Shilov, *Homogeneous rings of functions*, Uspekhi Mat. Nauk **6** (1951), no. 1, 89–135. (Russian)
51. ———, *Homogeneous rings of functions on the torus*, Dokl. Akad. Nauk SSSR **85** (1952), no. 5. (Russian)
52. J. Arazy and S. Fisher, *Some aspects of the minimal Möbius invariant space of analytic functions on the unit disk*, Interpolation spaces and related topics in analysis (Lund, 1983), Lecture Notes in Math., vol. 1070, Springer-Verlag, Berlin, 1984, pp. 24–44.
53. J. Arazy, S. Fisher, and J. Peetre, *Möbius-invariant function spaces*, J. Reine Angew. Math. **363** (1985), 110–144.
54. R. Arens, *The maximal ideals of certain function algebras*, Pacific J. Math. **8** (1958), 641–648.
55. C. A. Berenstein, *An inverse spectral theorem and its relation to the Pompeiu problem*, J. Analyse Math. **37** (1980), 128–144.
56. ———, *A test for holomorphy in the unit ball of* $\mathbb{C}^n$, Proc. Amer. Math. Soc. **90** (1984), no. 1, 88–90.
57. C. A. Berenstein and L. Zalcman, *Pompeiu's problem on symmetric cpaces*, Comment. Math. Helv. **55** (1980), 593–621.
58. C. A. Berenstein and M. Shahshahani, *Harmonic analysis and the Pompeiu problem*, Amer. J. Math. **105** (1983), no. 5, 1217–1229.
59. A. G. Brandstein, *Compact 2-manifolds as maximal ideal spaces*, Proc. Amer. Math. Soc. **41** (1973), no. 2, 438–450.
60. J.-E. Björk, *Compact groups operating on Banach algebra*, Math. Ann. **205** (1973), no. 4, 281–297.
61. J. Delsart, *Note sur une propriété nouvelle des fonctions harmoniques*, C. R. Acad. Sci. Paris Ser. I Math. **246** (1958), 1358–1360.
62. J. Delsart and J. L. Lions, *Moyennes generalisées*, Comment. Math. Helv. **33** (1959), 59–69.
63. L. M. Druzkowski, *Continuous holomorphic extension from the boundary in Banach space*, Proc. Intern. Conf. on Complex Anal. and Appl., Varna, 1981, pp. 157–160.
64. M. Educhi, M. Hashirime, and K. Okamoto, *The Paley-Wiener theorem for distributions on symmetric space*, Hiroshima Math. J. **3** (1973), no. 1, 109–120.
65. M. Freeman, *Uniform approximation on a real analutic manifold*, Trans. Amer. Math. Soc. **143** (1969), 545–553.
66. G. B. Folland and E. M. Stein, *Hardy spaces on homogeneous groups* M, Math. Notes **28**, Princeton Univ. Press, Princeton, NJ, 1982.
67. R. Gangolli, *Invariant function algebras on compact semisimple Lie groups*, Bull. Amer. Math. Soc. **71** (1965), no. 3, 634–637.

68. J. Globevnik, *On boundary values of holomorphic functions on balls*, Proc. Amer. Math. Soc. **85** (1982), 61–64.
69. ———, *On holomorphic extensions from spheres in* $\mathbb{C}^2$, Proc. Roy. Soc. Edinburg **94A** (1983), 113–120.
70. ———, *A family of lines for testing holomorphy in the ball of* $\mathbb{C}^2$, preprint, vol. 24, Ljubljana Univ., Ljubljana, 1986.
71. ———, *Analyticity on rotation invariant families of curves*, Trans. Amer. Math. Soc. **280** (1983), 247–254.
72. D. Geller, *Fourier analysis on the Heisenberg group*, Proc. Nat. Acad. Sci. U.S.A. **74** (1977), 1328–1331.
73. E. Grinberg, *Boundary values of holomorphic functions, Radon transform and the one dimensional extension property*, preprint, Temple University, 1985.
74. ———, *A boundary analogue of Morera's theorem in the unit ball of* $\mathbb{C}^n$, Proc. Amer. Math. Soc. **102** (1988), no. 1, 114–116.
75. L. R. Hunt and R. O. Wells, Jr., *Extension of CR-functions*, Amer. J. Math. **98** (1976), 805–820.
76. L. Hörmander and J. Wermer, *Uniform approximation on compact sets in* $\mathbb{C}^n$, Math. Scand. **23** (1968), no. 1, 5–21.
77. K. D. Johnson, *On a ring of invariant polynomials on a Hermitian symmetric space*, J. Algebra **67** (1980), 72–81.
78. S. Kobayashi, *Fixed points of isometries*, Nagoya Math. J. **13** (1958), 63–68.
79. A. Koranyi, *Poisson integral and boundary components of symmetric spaces*, Invent. Math. **34** (1976), 19–34.
80. K. de Leeuw and H. Mirkil, *Intrinsic algebras on the torus*, Trans. Amer. Math. Soc. **81** (1956), 320–330.
81. ———, *Translation-invariant funcion algebras on abelian groups*, Bull. Soc. Math. France **88** (1960), 345–370.
82. ———, *Rotation-invariant algebras on the n-sphere*, Duke Math. J. **30** (1961), no. 4, 667–672.
83. ———, *Algebras of differentiable functions in the plane*, Ann. Inst. Fourier (Grenoble) **13** (1963), no. 2, 75–90.
84. A. Nagel and W. Rudin, *Möbius-invariant function spaces on balls and spheres*, Duke Math. J. **43** (1976), 841–865.
85. R. D. Ogden and S. Vagi, *Harmonic analysis on a nilpotent group and function theory of Siegel domains of type.* II, Adv. in Math. **33** (1979), no. 1, 31–92.
86. J. Peetre, *Invariant function spaces—a rapid survey*, technical report (1985), Lund.
87. ———, *Paracommutators and minimal spaces*, Operators and function theory, Reidel, Dordrecht, 1985, pp. 163–224.
88. D. Rider, *Translation-invariant Dirichlet algebras on compact groups*, Proc. Amer. Math. Soc. **17** (1966), no. 5, 977–985.
89. W. Rudin, *Unitarily invariant algebras of continuous functions on spheres*, Houston J. Math. **5** (1979), 253–265.
90. ———, *Möbius-invariant algebras in balls*, Ann. Inst. Fourier (Grenoble) **33** (1983), no. 2, 19–41.
91. ———, *Eigenspaces of invariant Laplacian in* B^n, J. Analyse Math. **43** (1983/1984), 136–148.
92. L. A. Rubel, *Möbius-invariant spaces of continuous fuctions*, Bull. Greek Math. Soc. **20** (1979), 94–97.
93. ———, *Harmonic analysis of harmonic functions in the plane*, Proc. Amer. Math. Soc. **54** (1976), no. 1, 146–148.
94. L. A. Rubel and A. L. Shields, *Invariant subspaces of* L^∞ *and* H^∞, J. Reine Angew. Math. **272** (1975), 32–44.
95. L. A. Rubel and R. M. Timoney, *An extremal property of the Bloch space*, Proc. Amer. Math. Soc. **75** (1979), 45–49.
96. E. L. Stout, *The boundary values of holomorphic functions of several complex variables*, Duke Math. J. **44** (1977), 105–108.

97. W. Schmid, *Die Randwerte holomorpher Funktionen und hermitische symmetrischen Räumen*, Invent. Math. **9** (1969/70), 61–80.
98. L. Schwartz, *Théorie générale des fonctions moyenne-périodiques*, Ann. of Math. **42** (1947), 857–929.
99. M. Takeuchi, *Polynomial representations associated with bounded symmetric domains*, Osaka J. Math. **10** (1973), 441–445.
100. R. M. Timoney, *Maximal invariant spaces of analytic functions*, Indiana Univ. J. Math. **31** (1982), 651–664.
101. J. A. Tirao, *Self-adjoint function spaces on Riemannian symmetric spaces*, Proc. Amer. Math. Soc. **24** (1970), 223–228.
102. J. Wermer, *Approximation on a disk*, Math. Ann. **155** (1964), 331–333.
103. ———, *Polynomially convex disks*, Math. Ann. **158** (1965), 6–10.
104. J. A. Wolf, *Selfadjoint function spaces on Riemann symmetric spaces*, Proc. Amer. Math. Soc. **113** (1964), 299–315.
105. ———, *Translation-invariant function algebras on compact groups*, Pacific J. Math. **15** (1965), no. 3, pp. 1093–1099.
106. L. Zalcman, *Analyticity and the Pompeiu problem*, Arch. Rational Mech. Anal. **47** (1972), 237–254.
107. ———, *Offbeat integral geometry*, Amer. Math. Monthly **87** (1980), no. 3, 161–175.

References added for the English edition

108. Y. Beniamini and Y. Weit, *Harmonic analysis of spherical functions on* $SU(1,1)$, Ann. Inst. Fourier (Grenoble) **42** (1992), no. 3, 671–694.
109. Y. Globevnik and E. L. Stout, *Boundary Morera theorems for holomorphic functions of several complex variables*, Duke Math. J. **64** (1991), 571–615.
110. M. L. Agranovskiĭ and A. M. Semenov, *Boundary analogues of Hartogs' theorem*, Siberian Math. J. **32** (1991), no. 1.
111. C. Berenstein, D. C. Chang, D. Pascus, and L. Zalcman, *Variation on the theorem of Morera*, Contemporary Math. (1992, to appear).
112. M. L. Agranovskiĭ, C. Berenstein, D. C. Chang, and D. Pascus, *A Morera type theorem for* L^2*-functions in the Heisenberg group*, J. Analyse Math. **57** (1991).
113. ———, *Théorémes de Morera et Pompeiu pour le groupe de Heisenberg*, C. R. Acad. Sci. Paris Sér. I Math. (1992, to appear).
114. M. L. Agranovskii, C. Berenstein, and D. C. Chang, *Morera theorem for holomorphic* H^p*-spaces in the Heisenberg group*, J. Reine Angew. Math. (to appear).
115. S. Thangavelu, *Spherical means and CR functions on the Heisenberg group*, J. Analyse Math. (to appear).
116. J. Faraut and A. Koranyi, *Function spaces and reproducing kernels on bounded symmetric domain*, J. Funct. Anal. **88** (1990), no. 1, 64–89.
117. J. Arazy, *Realization of the invariant inner product on the highest quotients of the composition series*, Ark. Mat. **30** (1992), no. 1, 1–24.

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