

Bibliography

1. Alifanov, O.M.; Zantsev, V.K.; Pankratov, B.M. et al. (Ed.: Academician V.P. Mishin): Algorithms for diagnostics of heat loads of flying vehicles. Moscow, Mashinostroenie, 1983, (in Russian).
2. Aldoshin, G.T.; Golosov, A.S.; Zhuk, V.I.: Solution of an inverse problem of transient heat conduction for a slab. In: "Heat and mass transfer" (in Russian). Minsk, Nauka i Tekhnika, Vol. 8, 1968, pp. 186–199.
3. Alifanov, O.M.: Solution of the problem of transient heat conduction and its application to studying heat shield materials. In: "Investigations of transient convective heat and mass transfer" (in Russian). Minsk, Nauka i Tekhnika, 1971, pp. 322–333.
4. Alifanov, O.M.: Rugularization of solutions of inverse problem of heat conduction. In: "Heat Transfer-Soviet Research" (USA), Vol. 5, No. 4, 163, 1973.
5. Alifanov, O.M.: Inverse problem of heat conduction. J. Eng. Phys., 1973, Vol. 25, No. 3, pp. 1187–1192.
6. Alifanov, O.M.: Direct methods of solving linear reverse heat-conduction problems. J. Eng. Phys., 1973, Vol. 24, No. 6, pp. 791–797.
7. Alifanov, O.M.: Regularization of the scheme for solving reverse heat-conduction problems. J. Eng. Phys., 1973, Vol. 24, No. 2, pp. 235–241.
8. Alifanov, O.M.: Numerical solution of a nonlinear reverse problem of heat conduction. J. Eng. Phys., 1973 Vol. 25, No. 2, pp. 1070–1076.
9. Alifanov, O.M.: Determination of boundary thermal regime from the solution of an inverse heat-conduction problem. J. Eng. Phys., 1974, Vol. 26, No. 2, pp. 246–253.
10. Alifanov, O.M.: Regularization schemes for approximate solution of nonlinear reverse problem of heat-conduction. J. Eng. Phys., 1974, Vol. 26, No. 1, pp. 90–94.
11. Alifanov, O.M.: Solution of an inverse problem of heat-conduction by iterative methods. J. Eng. Phys., 1974, Vol. 26, No. 4, pp. 471–476.
12. Alifanov, O.M.: Inverse boundary-value problems of heat-conduction. J. Eng. Phys., 1975, Vol. 29, No. 1, pp. 821–830.
13. Alifanov, O.M.: Gradient methods of reconstructing boundary heat conditions. In: "Heat and mass transfer -V" (in Russian), Vol. 9, Minsk, 1976, pp. 85–93.
14. Alifanov, O.M.: Inverse heat-transfer problems in the investigation of thermal processes and the design of engineering systems. J. Eng. Phys., 1977, Vol. 33, No. 6, pp. 1402–1409.
15. Alifanov, O.M.: Determination of heat loads from a solution of the nonlinear inverse problem. High Temperature, 1977, Vol 15, No. 3, pp. 498–504.
16. Alifanov, O.M., Some questions involved in the solution of inverse problems in heat conduction and automated data processing in thermophysical investigations. J. Eng. Phys., 1980, Vol. 39, No. 2, pp. 831–837.
17. Alifanov, O.M.: Identification of processes of heat and mass transfer by methods of inverse problems. In: Modern experimental methods of studying the processes of heat and mass transfer (in Russian). Proc. of Int. school-seminar. Part 2, Minsk, Izd. ITMO Akad. Nauk BSSR, 1981, pp. 133–147.
18. Alifanov, O.M.: Methods of solving ill-posed problems. J. Eng. Phys., 1983, Vol. 45, No. 5, pp. 1237–1245.
19. Alifanov, O.M.: Identification of physical processes and inverse problems. J. Eng. Phys., 1985, Vol. 49, No. 6, pp. 1380–1386.
20. Alifanov, O.M.: A method of taking account of a priori information in solving incorrect inverse problems. J. Eng. Phys., 1985, Vol. 49, No. 6, pp. 1412–1418.

21. Alifanov, O.M.; Artyukhin, E.A.: Regularized numerical solution of nonlinear inverse heat-conduction problem. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 934–938.
22. Alifanov, O.M.; Artyukhin, E.A.: Determination of boundary conditions during thermal gasdynamic testing. *High Temperature*, 1978, Vol. 16, No. 4, pp. 699–704.
23. Alifanov, O.M.; Artyukhin, E.A.; Loginov, S.N.; Malozemov, V.V.: Solution of inverse problems of heat conduction by the method of dynamic filtration. *J. Eng. Phys.*, 1981, Vol. 41, No. 5, pp. 1260–1264.
24. Alifanov, O.M.; Artyukhin, E.A.; Pankratov, B.M.: Solution of the nonlinear inverse problem for a generalized heat-conduction equation in a region with moving boundaries. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 928–933.
25. Alifanov, O.M.; Artyukhin, E.A.; Rumyantsev, S.V.: Solution of boundary and coefficient inverse heat conduction problems by iterative methods. In: “Heat and mass transfer -VII” (in Russian), Vol. 9, Minsk, 1980, pp. 106–112.
26. Alifanov, O.M.; Artyukhin, E.A.; Tryanin, A.P.: Determining the heat-flux density at the boundary of a porous body from the solution of the inverse problem. *High Temperature*, 1983, Vol. 21, No. 6, pp. 888–895.
27. Alifanov, O.M.; Balashova, I.E.: Selection of approximate solutions of inverse heat-conduction problems. *J. Eng. Phys.*, 1985, Vol. 48, No. 5, pp. 626–632.
28. Alifanov, O.M.; Batura, N.I.; Bespalov, A.M.; Gorshkov, M.I.; Kuz'min, N.A.; Maiorov, A.I.: New method for nonsteady-heat-transfer investigations in a thermal aerodynamic tube. *J. Eng. Phys.*, 1977, Vol. 33, No. 6, pp. 1413–1416.
29. Alifanov, O.M.; Gorshkov, M.I.; Zantsev, V.K.; Pankratov, B.M.: Transient heat transfer between a solid and a plasma stream. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 831–834.
30. Alifanov, O.M.; Egorov, Yu.V.: Algorithms and results of solving the inverse heat-conduction boundary problem in a two-dimensional formulation. *J. Eng. Phys.*, 1985, Vol. 48, No. 4, pp. 489–496.
31. Alifanov, O.M.; Kerov, N.V.: Determination of external thermal load parameters by solving the two-dimensional inverse heat-conduction problem. *J. Eng. Phys.*, 1981, Vol. 41, No. 4, pp. 1049–1053.
32. Alifanov, O.M.; Klibanov, M.V.: Uniqueness conditions and method of solution of the coefficient inverse problem of thermal conductivity. *J. Eng. Phys.*, 1985, Vol. 48, No. 6, pp. 730–735.
33. Alifanov, O.M.; Mikhailov V.V.: Solution of the nonlinear inverse thermal conductivity problem by the iteration method. *J. Eng. Phys.*, 1978, Vol. 35, No. 6, pp. 1501–1506.
34. Alifanov, O.M.; Mikhailov, V.V.: Determining thermal loads from the data of temperature measurements in a solid. *High temperature*, 1983, Vol. 21, No. 5, pp. 724–730.
35. Alifanov, O.M.; Mikhailov, V.V.: Solution of the overdetermined inverse problem of thermal conductivity involving inaccurate data. *High Temperature*, 1985, Vol. 23, No. 1, pp. 112–117.
36. Alifanov, O.M.; Rumyantsev, S.V.: One method of solving incorrectly stated problems. *J. Eng. Phys.*, 1978, Vol. 34, No. 2, pp. 223–226.
37. Alifanov, O.M.; Rumyantsev, S.V.: On the stability of iterative methods for the solution of linear ill-posed problems. *Soviet Math. Dokl.*, 1979, Vol. 20, No. 5, pp. 1133–1136.
38. Alifanov, O.M.; Rumyantsev, S.V.: Regularising gradient algorithms for inverse thermal-conduction problems. *J. Eng. Phys.*, 1980, Vol. 39, No. 2, pp. 858–861.
39. Alifanov, O.M.; Tryanin, A.P.: Determination of the coefficient of internal heat exchange and the effective thermal conductivity of a porous solid on the basis of a nonstationary experiment. *J. Eng. Phys.*, 1985, Vol. 48, No. 3, pp. 356–365.
40. Artyukhin, E.A.: Determination of thermal diffusivity from experimental data. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 878–881.
41. Artyukhin, E.A.: Reconstruction of the thermal conductivity coefficient from the solution of the nonlinear inverse problem. *J. Eng. Phys.*, 1981, Vol. 41, No. 4, pp. 1054–1058.
42. Artyukhin, E.A.: Recovery of the temperature dependence of the thermal conductivity coefficient from the solution of the inverse problem. *High Temperature*, 1981, Vol. 19, No. 5, pp. 698–702.
43. Artyukhin, E.A.: Sensitivity analysis and experiment design in the problems of identification of processes of generalized heat conduction (in Russian). In: “Heat- and Mass Transfer-VII”. Minsk, v. 7, 1984, pp. 81–84.
44. Artyukhin, E.A.: Experimental design of measurements for the solution of coefficient-type inverse heat-conduction problem. *J. Eng. Phys.*, 1985, Vol. 48, No. 3, pp. 372–376.
45. Artyukhin, E.A.; Killikh, V.E.; Okhapkin A.S.: Reconstructing the effective coefficient of

- thermal conductivity of asbestos-textolite from the solution of the inverse problem. *J. Eng. Phys.*, 1983, Vol. 45, No. 5, pp. 1281–1286.
46. Artyukhin, E.A.; Okhapkin, A.S.: Determination of the parameters in the generalized heat-conduction equation from transient experimental data. *J. Eng. Phys.*, 1982, Vol. 42, No. 6, pp. 693–698.
 47. Artyukhin, E.A.; Okhapkin, A.S.: Parametric analysis of the accuracy of solution of a nonlinear inverse problem of recovering the thermal conductivity of a composite material. *J. Eng. Phys.*, 1983, Vol. 45, No. 5, pp. 1275–1281.
 48. Artyukhin, E.A.; Rummyantsev, S.V.: A gradient method of defining smooth solutions to inverse boundary-value problems in thermal conduction. *J. Eng. Phys.*, 1980, Vol. 39, No. 2, pp. 862–865.
 49. Artyukhin, E.A.; Rummyantsev, S.V.: Optimal choice of descent steps in gradient methods of solution of inverse heat conduction problems. *J. Eng. Phys.*, 1980, Vol. 39, No. 2, pp. 865–869.
 50. Budnik, S.A.: The problem of planning thermal measurements. *J. Eng. Phys.*, 1980, Vol. 39, No. 2, pp. 840–844.
 51. Budak, B.M.; Samarsky, A.A.; Tikhonov A.N.: Problem Exercises for mathematical physics (in Russian). Nauka, Moscow, 1972.
 52. Bulychev, E.V.; Glasko, V.B.; Fedorov, S.M.: Reconstructing initial temperature from value measured on surface. *USSR Comput. Math. and Math. Phys.*, 1983, Vol. 23, No. 6.
 53. But, E.N.: Spline identification of heat fluxes. *J. Eng. Phys.*, 1977, Vol. 33, No. 6, pp. 1085–1089.
 54. Vanichev, A.P.: An approximate method of solving heat conduction problems in solids (in Russian). *Izv. Akad. Nauk SSSR, Ser. OTN*, 1946, No. 12, pp. 1767–1774.
 55. Vasil'ev, F.P.: Lectures on the methods of solving extremal problems (in Russian). *Izd. Moscow State Univ.*, Moscow, 1974.
 56. Vasil'ev, F.P.: Methods of solving extremal problems (in Russian). Nauka, Moscow, 1981.
 57. Vladimirov, V.S.: Equations of mathematical physics (in Russian). Nauka, Moscow, 1976.
 58. Voevodin, V.V.: The method of regularization. *USSR Comput. Math. and Math. Phys.*, 1969, Vol. 9, No. 3, pp. 228–232.
 59. Volkov, V.M.: An inverse problem for quasi-linear equation of parabolic type (in Russian). In: "A study of inverse problems correctness and some operator equations", *Vichisl. Centre, Sibirsk. Otdel. Akad. Nauk SSSR, Novosibirsk*, 1981, pp. 27–36.
 60. Volkov, V.M.: An inverse problem for quasi-linear equation of parabolic type (in Russian). In: "Ill-posed problems of Mathematical physics and analysis", Nauka, Novosibirsk, 1984, pp. 227–228.
 61. Voskoboinikov, Yu. E.; Preobrazhensky, N.G.; Sedelnikov A.I.: Mathematical processing of an experiment in molecular gas dynamics (in Russian). Nauka, Novosibirsk, 1984.
 62. Voskoboinikov, Yu. E.; Thomsons, Ya. Ya.: Construction of a regularized solution to one inverse heat-conduction problem with random errors in the initial data. *J. Eng. Phys.*, 1977, Vol. 33, No. 6, pp. 1489–1493.
 63. Geraschenko, O.A.: Fundamentals of heat thermometry (in Russian). *Naukova Dumka*, Kiev, 1971.
 64. Glasko, V.B.: Inverse problems of mathematical physics. *Izd. Moscow State Univ.*, Moscow, 1984. English transl. in American Institute of Physics, New York, 1984.
 65. Goltsov, A.S.; Simbirsky, D.F.: Identification of an nonstationary nonlinear heat object using the Kalmann filter (in Russian). *Avtometria*, 1975, No. 1, pp. 36–42.
 66. Goncharsky, A.V.; Yagola, A.G.; Leonov, A.G.: A generalized discrepancy principle, *USSR Comput. Math. and Math. Phys.*, 1973, Vol. 13, No. 2, pp. 25–38.
 67. Gordonova V.I., Morozov, V.A.: Numerical algorithms for the selection of the parameter in the regularization method. *USSR Comput. Math. and Math. Phys.*, 1973, Vol. 13, No. 3, pp. 1–9.
 68. Goryachev, A.A.; Yudin, V.M.: Solution of the inverse coefficient problem of heat conduction. *J. Eng. Phys.*, 1982, Vol. 43, No. 4, pp. 1148–1154.
 69. Ditkin, V.A.; Prudnikov, A.P.: Operational calculus (in Russian). *Vyshshaya Shkola*, Moscow, 1975.
 70. Zhuk, V.I.; Golosov, A.S.: Engineering methods of determining thermal boundary conditions by means of temperature measurement data. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 845–849.
 71. Iskenderov, A.D.: An inverse problem for quasilinear parabolic equations. *Differential equations*, 1974, Vol. 10, No. 5, pp. 687–692.
 72. Kalinnikov, L.D.; Shumakov, N.V.: The inverse problem of thermal conductivity for a plate. *High Temperature*, 1971, Vol. 9, No. 4, pp. 733–736.
 73. Kamyinin, L.I.: On the existence of solution of boundary-value problems for a parabolic

- equation with discontinuous coefficients (in Russian). *Izv. Akad. Nauk SSSR, ser. Mat.*, 1964, Vol. 28, pp. 721–744.
74. Karmanov, V.G.: *Mathematical programming* (in Russian). Nauka, Moscow, 1980.
 75. Kartashov, E.M.: *Analytical methods in heat conduction of solids* (in Russian). Vysshaya Shkola, Moscow, 1979.
 76. Kerov, N.V.: Solution of the two-dimensional inverse heat-conduction problem in a cylindrical coordinate system. *J. Eng. Phys.*, 1983, Vol. 45, No. 5, pp. 1245–1249.
 77. Klibanov, M.V.: Uniqueness in the large of solutions of inverse problems for a class of differential equations. *Differential equations*, 1984, Vol. 20, No. 11, pp. 1390–1395.
 78. Klibanov, M.V.: On a class of inverse problems for nonlinear parabolic equations. *Soviet Math. Dokl.*, 1985, Vol. 31, No. 1, pp. 104–107.
 79. Kover'yanov, V.A.: Inverse problem of nonsteady-state thermal conductivity. *High Temperature*, 1967, Vol. 5, No. 1, pp. 121–127.
 80. Kozdoba, L.A.: *Solution of nonlinear problems of heat conduction* (in Russian). Naukova Dumka, Kiev, 1976.
 81. Kozdoba, L.A.; Krukovsky, P.G.: *Method of solving inverse problems of heat transfer* (in Russian). Naukova Dumka, Kiev, 1982.
 82. Kozdoba, L.A.; Krivoshey, F.A.: Determination of thermal properties of solids by electric simulation of solutions of inverse problems of transient heat conduction (in Russian). In: "Thermophysical properties of solids", Nauka, Moscow, 1973, pp. 28–31.
 83. Kolmogorov, A.N.; Fomin, S.V.: *The elements of function theory and functional analysis* (in Russian). Nauka, Moscow, 1972.
 84. Kondratiev, G.M.: *Regular heat regime* (in Russian). Gostekhizdat, Moscow, 1954.
 85. Kochetov, I.I.: A new way of choosing the regularization parameter. *USSR Comput. Math. and Math. Phys.*, 1976, Vol. 16, No. 2, pp. 215–219.
 86. Kudryavtsev, E.V.; Chakalev, K.N.; Shumakov, N.V.: *Transient heat transfer* (in Russian). *Izd. Akad. Nauk SSSR*, Moscow, 1961.
 87. Kuzmin, M.P.: *Electric simulation of transient processes of heat transfer* (in Russian). Energiya, Moscow, 1974.
 88. Lavrent'ev, M.M.: Some improperly posed problems of mathematical physics (in Russian). *Izd. Sib. Otd. Akad. Nauk SSSR*, Novosibirsk, 1962. English transl. in Springer-Verlag, New York, 1967.
 89. Lavrent'ev, M.M.; Romanov, V.G.; Shishatskii, S.P.: *Ill-posed problems of mathematical physics and analysis* (in Russian). Nauka, Moscow, 1980. English transl. in *Trans. of Math. Monographs*, Vol. 64, American Mathematical Society, Providence, Rhode Island, 1986.
 90. Ladyzhenskaya, O.A.: *Boundary-value problems of mathematical physics* (in Russian). Nauka, Moscow, 1973.
 91. Ladyzhenskaya, O.A.; Solonnikov, V.A.; Ural'tseva, N.N.: *Linear and quasilinear equations of parabolic type* (in Russian). Nauka, Moscow, 1967.
 92. Liscovec, O.A.: A method of choosing the regularization parameter to solve nonlinear ill-posed problem. *Soviet Math. Dokl.*, 1976, Vol. 17, No. 4, pp. 1013–1017.
 93. Lyikov, A.V.: *The theory of heat conduction* (in Russian). Vysshaya Shkola, Moscow, 1967.
 94. Lyikov, A.V.: *Heat and mass transfer* (in Russian). Reference book, Energiya, Moscow, 1972.
 95. Matsevity, Yu. M.: *Electric simulation of nonlinear problems of engineering thermophysics* (in Russian). Naukova Dumka, Kiev, 1977.
 96. Matsevity, Yu. M.; Multanovsky, A.V.: *Identification in the problems of heat conduction* (in Russian). Naukova Dumka, Kiev, 1982.
 97. "Methods of determination of heat conduction and thermal diffusivity". A.G. Shakhov, G.M. Volokhov, T.N. Abramenko, V.P. Kozlov. – Ch. ed. A.V. Lyikov, Energiya, Moscow, 1973 (in Russian).
 98. Mikhailov, V.V.: Optimization of multilayer thermal insulation. *J. Eng. Phys.*, 1980, Vol. 39, No. 2, pp. 880–884.
 99. Mikhailov, V.V.: Question of the convergence of iteration methods of solving the inverse heat-conduction problem. *J. Eng. Phys.*, 1983, Vol. 45, No. 5, pp. 1263–1266.
 100. Mishin, V.P.; Alifanov, O.M.: Inverse problems of heat exchange – fields of application in the planning and testing technical objects. *J. Eng. Phys.*, 1982, Vol. 42, No. 5, pp. 115–123.
 101. Simulation of heat conditions of a space vehicle and environment. L.V. Kozlov, M.D. Nusinov, A.I. Akishin, et al., Ch. ed. Academician G.I. Petrov, Mashinostroenie, Moscow, 1971 (in Russian).

102. Morozov, V.A.: Regularization of incorrectly posed problems and the choice of regularization parameter, *USSR Comput. Math. and Math. Phys.*, 1966, Vol. 6, No. 1, pp. 242–251.
103. Morozov, V.A.: Methods of solving unstable problems (in Russian). *Izd. Vychisl. Centre, Moscow State Univ.*, Moscow, 1967.
104. Morozov, V.A.: The error principle in the solution of operational equations by the regularization method. *USSR Comput. Math. and Math. Phys.*, 1968, Vol. 8, No. 2, pp. 63–87.
105. Morozov, V.A.: Regular methods of solving ill-posed problems (in Russian). *Izd. Moscow State Univ.*, Moscow, 1974.
106. Muzylev, N.V.: Uniqueness theorems for some inverse problems of heat transfer. *USSR Comput. Math. and Math. Phys.*, 1980, Vol. 20, No. 2, pp. 120–134.
107. Muzylev, N.V.: Uniqueness of simultaneous determining of coefficients of thermal conductivity and volumetric heat capacity, *Zh. Vychisl. Mat. Mat. Fiz.*, 1983, Vol. 23, No. 1, pp. 102–108. – Engl. transl. in *USSR Comput. Math. and Math. Phys.*, 1983, Vol. 23, No. 1.
108. Myuntz, G.: Integral equations (in Russian). *Gostekhizdat, Moscow-Leningrad*, 1934, P.I.
109. Koshkin, V.K.; Kalinin, E.K.; Dreytser, G.A. et al.: (in Russian). *Transient heat transfer. Mashinostroenie*, Moscow, 1973.
110. Nikitenko, N.I.: Study of nonstationary heat- and mass-transfer processes by the grid method (in Russian). *Naukova Dumka, Kiev*, 1978.
111. Omelchenko, K.G.; Volodina, M.V.: Analysis of inverse heat-conduction problems by means of similarity solutions. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 860–862.
112. Omelchenko, K.G.; Pchyolkina, V.G.: Solution of an inverse problem of nonlinear heat conduction to determine thermophysical characteristics. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 885–887.
113. Omelchenko, K.G.; Savelov, M.V.; Timoshenko, V.P.: Investigation of heat- and mass-transfer processes in decomposing porous materials, *High Temperature*, 1974, Vol. 12, No. 4, pp. 664–670.
114. The fundamentals of heat transfer in aviation and rocketry. V.S. Avduevsky, D.M. Galitseisky, G.A. Glebov, et al., ch. ed. V.K. Koshkin, *Mashinostroenie*, Moscow, 1975 (in Russian).
115. Okhapkin, A.S.: Study of the heat-transfer characteristics of a thermally protective composite materials. *J. Eng. Phys.*, 1985, Vol. 49, No. 6, pp. 1469–1473.
116. Pankratov, B.M.: Thermal design of units of flying vehicles (in Russian). *Mashinostroenie*, Moscow, 1981.
117. Pankratov, B.M.; Polezhaev, Yu. V.; Rud'ko, A.K.: Materials interaction with gas flows (in Russian). *Mashinostroenie*, Moscow, 1975.
118. Pekhovich, A.I.; Zhidkikh, V.M.: Analysis of heat regime of solids (in Russian). *Energiya*, Moscow, 1976.
119. Petrovsky, I.G.: Lectures on equations with partial derivatives (in Russian). *Fizmatgiz*, Moscow, 1961.
120. Platonov, E.S.: Thermophysical calculations for monotonous regime (in Russian). *Energiya*, Leningrad, 1973.
121. Polezhaev, Yu.V.; Killikh, V.E.; Narozhnyi, Yu.G.: Problems regarding the transient heating of heat shielding materials. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 840–844.
122. Polezhaev, Yu.V.; Narozhny, Yu.G.; Safonov, V.E.: A method for determining the thermal conductivity coefficient of high-temperature materials during their unsteady heating. *High Temperature*, 1973, Vol. 11, No. 3, pp. 543–548.
123. Polezhaev, Yu.V.; Yurevich, F.B.: Heat protection (in Russian). *Energiya*, Moscow, 1976.
124. Prosuntsov, P.V.; Reznik, S.V.: Determination of the thermophysical properties of translucent materials. *J. Eng. Phys.*, 1985, Vol. 49, No. 6, pp. 1458–1462.
125. Rummyantsev, S.V.: Ways of allowing for a priori information in regularizing gradient algorithms, *J. Eng. Phys.*, 1985, Vol. 49, No. 6, pp. 1418–1421.
126. Samarsky, A.A.: A theory of difference schemes (in Russian). *Nauka*, Moscow, 1977.
127. Simbirsky, D.F.: The temperature diagnostics of engines (in Russian). *Tekhnika*, Kiev, 1976.
128. Simbirsky, D.F.; But E.N.: The measurement of heat fluxes by one-dimensional temperature detectors using the Kalmann filter and spline-approximation (in Russian). In: "Experimental methods of investigation of gas-turbine engines", *Kharkov*, 1975, Iss. 2, pp. 33–43.
129. Smolskyi, B.M.; Sergeeva, L.A.; Sergeev, V.L.: Transient heat transfer (in Russian). *Nauka i Tekhnika*, Minsk, 1974.
130. Stechkin, S.B.; Subotin, Yu. N.: Splines in computational mathematics (in Russian). *Nauka*, Moscow, 1976.

131. Strahov, V.N.; Valjashko, G.M.: On the problem of choosing the regularization parameter when solving ill-posed linear problems. *Soviet Math. Dokl.*, 1976, Vol. 17, No. 3, pp. 664–668.
132. Tyomkin, A.G.: Determination of time dependent external heat actions by methods of heat conduction (in Russian). *Izv. Vyssh. Uchebn. Zaved., Ser. Energetika*, 1961, No. 5, pp. 60–71.
133. Tyomkin, A.G.: Inverse methods of heat conduction (in Russian). *Energiya*, Moscow, 1973.
134. Heat- and mass- exchange in the flow of heated gas, A.G. Shashkov, F.B. Yurevich, V.L. Sergeev, et al., ch. ed. A.G. Shashkov, *Nauka i Tekhnika*, Minsk, 1974.
135. Tikhonov, A.N.: On a heat conduction equation for several variables (in Russian). *Byull. Moscow State Univ., Section A*, 1938, Vol. 1, Iss. 9, pp. 1–49.
136. Tikhonov, A.N.: On the stability of inverse problems (in Russian). *Dokl. Akad. Nauk SSSR*, 1943, Vol. 39, No. 5, pp. 195–198.
137. Tihonov (Tikhonov), A.N.: Solution of incorrectly formulated problems and the regularization method. *Soviet Math. Dokl.*, 1963, Vol. 4, No. 4, pp. 1035–1038.
138. Tikhonov, A.N.: Regularization of incorrectly posed problems. *Soviet Math. Dokl.*, 1963, Vol. 4, No. 6, pp. 1624–1627.
139. Tikhonov, A.N.: Inverse problems in heat conduction. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 816–820.
140. Tikhonov, A.N.; Arsenin, V. Ya.: *Methods of solving ill-posed problems* (in Russian). *Nauka*, Moscow, 1986.
141. Tikhonov, A.N.; Glasko, V.B.: The approximate solution of Fredholm integral equations of the first kind. *USSR Comput. Math. and Math. Phys.*, 1964, Vol. 4, No. 3, pp. 236–247.
142. Tikhonov, A.N.; Glasko, V.B.: Use of the regularization method in nonlinear problems, *USSR Comput. Math. and Math. Phys.*, 1965, Vol. 5, No. 3, pp. 93–107.
143. Tikhonov, A.N.; Samarsky, A.A.: *Equations of mathematical physics* (in Russian). *Nauka*, Moscow, 1972.
144. Faddeyev, D.K.; Faddeyeva, V.N.: On ill-conditioned systems of linear equations. *USSR Comput. Math. and Math. Phys.*, 1961, Vol. 1, No. 3, pp. 447–454.
145. Faddeyev, D.K.; Faddeyeva, V.N.: *Computational methods of linear algebra* (in Russian). *Fizmatgiz*, Moscow-Leningrad, 1963.
146. Frolov, V.V.: Uniqueness theorems for the solution of the inverse problem of heat conduction. *J. Eng. Phys.*, 1975, Vol. 29, No. 1, pp. 923–927.
147. Cherpakov, P.V.: A theory of regular heat transfer (in Russian). *Energiya*, Moscow, 1975.
148. Shashkov A.G.; Kreychi, L.; Sergeev, V.L.: Transient heat transfer in plasma yet (in Russian). In: “Heat- and mass- transfer”. Minsk, 1972, Vol. 1, P. 1, pp. 373–378.
149. Shlensky, O.F.; Shashkov, A.G.; Aksonov, L.N.: *Thermal physics of decomposing materials* (in Russian). *Energoatomizdat*, Moscow, 1985.
150. Shumakov, N.V.: A method for the experimental study of the process of heating a solid body. – *Teplofiz. Zh.*, 1957, Vol. 27, No. 4, pp. 844–855. – Engl. transl. in *Soviet Physics* (translated by American Institute of Physics), Vol. 2, 1957, p. 771.
151. Shumakov, N.V.: A method of successive intervals in thermometry of transient processes (in Russian). *Atomizdat*, Moscow, 1979.
152. Yudin, V.M.: Distribution of heat in glass-reinforced plastics (in Russian). *Proc. of TsAGI*, Iss. 1267, *Izd. TsAGI*, Moscow, 1970.
153. Yaryishev, N.A.: Theoretical basis of measuring transient temperatures (in Russian). *Energiya*, Leningrad, 1967.
154. Arima R.: On General Boundary Value Problem for Parabolic Equation. *J. Math. Kyoto Univ.*, 1964, Vol. 4, No. 1, pp. 207–244.
155. Audley, D.R.; Hodge, J.K.: Identifying the Aerothermodynamic Environment of the Space Shuttle Orbiter, Columbia. *Proc. of 6-th IFAC Simp. Identification and System Parameter Estimation*, Arlington, Virginia, USA, June 7–11, 1982, pp. 1208–1213.
156. Bartlett, E.P.; Curry D.M.: Angevaluation of Flight Data for the Apollo Thermal Protection System. In: “Space Simul. Proc. Symp., New York, 1972”. Washington, D.C., 1972, pp. 749–768.
157. Bass, B.R.: Applications of the Finite Element to the Inverse Heat Conduction Problem Using Beck’s Second Method. *J. Eng. Ind.*, 1980, Vol. 102, pp. 168–176.
158. Beck, J.V.: Calculation of Surface Heat Flux from an Internal Temperature History. *ASME Paper 62-HT-46*, 1962.
159. Beck, J.V.: Surface Heat Flux Determination Using an Integral Method. *Nucl. Eng. Des.*, 1968, Vol. 7, No. 2, pp. 170–178.

160. Beck, J.V.: Nonlinear Estimation Applied to the Nonlinear Inverse Heat Conduction Problem. *Int. J. Heat and Mass Transfer*, 1970, Vol. 13, No. 4, pp. 703–716.
161. Beck, J.V.; Arnold, K.J.: *Parameter Estimation in Engineering and Science*. Wiley, New York, 1977.
162. Beck, J.V.; Blackwell, B.; St. Clair, C.R., Jr.: *Inverse Heat Conduction, Ill-posed Problems*. A Wiley-Interscience Publication, New York, 1985.
163. Beck, J.V.; Litkouhi, B.; St. Clair C.R., Jr: Efficient Sequential Solution of the Nonlinear Inverse Heat Conduction Problem. *Numer. Heat Transfer*, 1982, Vol. 5, pp. 275–286.
164. Beck, J.V.; Murio, D.: Combined Function Specification-Regularization Procedure for Solution of Inverse Heat Conduction Problem. *AIAA Paper No. AIAA-84-0491*, January 1984.
165. Beck, J.V.; Wolf, H.: The Nonlinear Inverse Heat Conduction Problem. *ASME Paper 65-HT-40*, 1965.
166. Bell, J.B.: The Noncharacteristic Cauchy Problem for Class of Equations with Time Dependence. -I. Problems in One Space Dimensions, *SIAM J. Math. Anal.*, 1981, Vol. 12, pp. 759–777.
167. Betrin, J.J.: Effects of Surface Temperature and Reynolds Number of Leeward Shuttle Heating, *J. Spacecraft*, 1976, Vol. 13, No. 8, pp. 473–480.
168. Blackwell, B.F.: An Efficient Technique for the Numerical Solution of the One-Dimensional Inverse Problem of Heat Conduction. *Numer. Heat Transfer*, 1981, Vol. 4, pp. 229–239.
169. Burggraf, O.R.: An Exact Solution of the Inverse Problem in Heat Conduction Theory and Applications. *J. Heat Transfer*, 1964, Vol. 86c., pp. 373–382.
170. Cannon, J.R.; Du Chateau, P.: An Inverse Problem for an Unknown Source in a Heat Equation. *J. of Math. Anal. and App.*, 1980, No. 75, pp. 465–485.
171. Cannon, J.R.; Du Chateau, P.: An Inverse Problem for an Nonlinear Diffusion Equation. *SIAM J. Appl. Math.*, 1980, Vol. 39, No. 2, pp. 272–289.
172. Carslaw, H.S.; Jaeger, J.C.: *Conduction of Heat in Solids*. 2-nd ed., Oxford Univ. Press, New York, 1959.
173. Cordero, J.; Diederich, F.W.; Hurwicz, H.: *Aerothermodynamic Test Techniques for Re-entry Structures and Materials*. Aerospace Engineering, 1963, Vol. 22, No. 1, pp. 170–191.
174. Davis Don., D.; Wood, C.: A Pyrotechnic-activated Calorimeter for Flight Research at Lunar Return Velocity. In: “*Utilis. Elements. Pyrotechn. et. Explosifs Systems Spat.*” Paris, 1969, pp. 369–378.
175. Deverall, L.I.; Channapragada, R.S.: A New Integral Equation for Heat Flux in Inverse Heat Conduction. *J. Heat Transfer*, 1966, Vol. 88 c, p. 327.
176. Douglas, J.: On the Numerical Integration of $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = \frac{\partial u}{\partial t}$ by Implicit Methods. *J. Soc. Industr. Appl. Math.*, 1955, Vol. 3, No. 1, pp. 42–65.
177. Fire I. The Reentry Heating Spacecraft. *NASA Facts*, 1965, Vol. 2, No. 11, pp. 1–8.
178. Forsythe, G.; Moler, C.B.: *Computer Solutions of Linear Algebraic Systems*. Prentice-Hall, Inc. Englewood Cliffs, New York, 1967.
179. Friedman, A.: *Partial Differential Equations of Parabolic Type*. Prentice-Hall, Inc. Englewood Cliffs, New York, 1964.
180. Hadamard, J.: *Lectures on Cauchy's Problem in Linear Partial Differential Equations*. Yale University Press, New Haven, CT, 1923.
181. *Heat Transfer and Spacecraft Thermal Control*. Ed. by J.W. Lucas. Ser. “Progress in Astronautics and Aeronautics”, Vol. 24, Jet Propulsion Laboratory, Pasadena, California, 1971.
182. Hills, R.G.; Mulholland, G.P.: Accuracy and Resolving Power of One-Dimensional Transient Inverse Heat Conduction Theory as Applied to Discrete and Inaccurate Measurements. *Int. J. Heat and Mass Transfer*, 1979, Vol. 22, pp. 1221–1229.
183. Imber, M.: Two-Dimensional Inverse Conduction Problem Further Observations. *AIAA J.*, 1975, Vol. 13, pp. 114–115.
184. Imber, M.: Nonlinear Heat Transfer in Planar Solids: Direct and Inverse Applications. *AIAA J.*, 1979, Vol. 17, pp. 204–212.
185. Imber, M.; Khan, J.: Prediction of Transient Temperature Distributions with Embedded Thermocouples. *AIAA J.*, 1972, Vol. 10, pp. 784–789.
186. Joerg, P.: Determination of Back Side Wall Temperatures of Ablative Rocket Nozzles, *Heat Transfer-Cleveland*. Chemical Engineering Progress Symposium series, 1965, Vol. 61, No. 59, pp. 99–107.
187. Lanczos, C.: *Applied Analysis*. Prentice Hall, Inc., 1956.

188. Langford, D.: New Analytic Solutions of the One-Dimensional Heat Equation for Temperature and Heat Flow Rate Both Prescribed at the Same Fixed Boundary. *Quart. Appl. Math.*, 1967, Vol. 24, No. 4, pp. 315–322.
189. Legendre, P.J., Chase, G.T.: The Operational Performance of Reentry Vehicle Heat Shield Thermodynamic Instrumentation. *Instrum. Aerospace Ind.* Vol. 19, Pittsburg, 1973, pp. 85–96.
190. Lorenzi, A.: An Inverse Problem for a Semilinear Parabolic Equation. *Annali di Mat. Pura ed Applicata*, 1982, Vol. 31, pp. 145–166.
191. Lotkin, M.: The Numerical Integration of Heat Conduction Equations. *J. Math. and Phys.*, 1958, Vol. 37, No. 2, pp. 178–187.
192. Mirsepasi, T.J.: Heat Transfer Charts for Time-Variable Boundary Conditions. Part I-Semi-Infinite Solid. *ASME Paper 58-SA-7*, 1958.
193. Murio, D.A.: The Modification Method and the Numerical Solution of an Inverse Heat Conduction Problem. *SIAM J. Sci. Stat. Comput.*, 1981, Vol. 2, pp. 17–34.
194. Murphy, J.D.: Flight Test Aerodynamic Heating Data for the Afterbody of the Project Mercury Spacecraft with Comparisons to Available Prediction Methods, NASA Contractor Report CR-649, Washington, 1967, p. 127.
195. Murphy, J.D.; Rubesin, M.W.: A Re-evaluation of Heat-Transfer Data Obtained in Flight Tests of Heat-sink Shielded Re-entry Vehicles. *AIAA Entry Technol. Conf.* Williamsburg-Hampton, Va, 1964. New York. Amer. Inst. Aeronaut. and Astronaut, pp. 77–92.
196. Peaceman, D.W.; Rachford, H.H.: The Numerical Solution of Parabolic and Elliptic Differential Equations. *J. Soc. Industr. Appl. Math.*, 1955, Vol. 3, No. 1, pp. 28–42.
197. Polak, E.: Computational Methods in Optimization. A Unified Approach. *Mathematics in Science and Engineering*. Vol. 77. Department of Electrical Engineering and Computer Sciences. University of California. Berkley, California, Academic Press. New York-London. 1971.
198. Protter, M.H.: Properties of Solutions of Parabolic Equations and Inequalities. *Canad. J. Math.*, 1961, Vol. 13, pp. 331–345.
199. Reinsch, C.H.: Smoothing by Spline Functions. *Numerische Mathematic*, Bd. 10, 1967, pp. 177–183.
200. Sparrow, E.M.; Haji-Sheikh, A.; Lundgren, T.S.: The Inverse Problem in Transient Heat Conduction. *J. Appl. Mech.*, Trans. ASME, series E, 1964, Vol. 86, pp. 369–375.
201. Speedy, C.B.; Brown, R.F.; Goodwin, G.C.: Control theory: Identification and Optimal Control. Oliver and Boyd Edinburgh, 1970.
202. Stefan, J.: On the Theory of Ice Formation, Especially on Ice Formation in Polar Seas (Über die Theorie der Eisbildung, insbesondere über die Eisbildung im Polarmeere) (In German). *Sitzungsberichte der Kaiserlichen Akademie Wiss. Wien. Math.-naturwiss. Kl.*, 1890, Vol. 98(2a), pp. 965–973.
203. Stolz, G.: Numerical Solutions to an Inverse Problem of Heat Conduction for Simple Shapes. *J. Heat Transfer*, 1960, Vol. 82, No. 1, pp. 20–26.
204. Vojvodich, N.S.: PAET Entry Heating and Heat Protection Experiment. *J. Spacecraft*, 1973, Vol. 10, No. 3, pp. 181–189.
205. Weber, C.F.: Analysis and Solution of the Ill-posed Inverse Heat Conduction Problem. *Int. J. Heat and Mass Transfer*, 1981, Vol. 24(11), pp. 1783–1792.
206. Wetmore, W.C.: Project Fire Design Nearing Completion. *Aviation Week and Space Technology*, December 1962, pp. 53–57.

An Additional Bibliography on Inverse Heat Transfer and Ill-Posed Problems (it is added after finalization of editing English text of the manuscript)

1. Alifanov, O.M.: Application of the regularization principle to the formulation of approximate solution of inverse heat-conduction problems. *J. Eng. Phys.*, 1972, Vol. 23, No. 6, pp. 1566–1571.
2. Alifanov, O.M.: Inverse-problem methods in thermophysical investigations and thermal design of technical systems (in Russian). In: “Heat- and Mass Transfer-VI”, Problem papers of the VI-th All-Union Conference on Heat- and Mass Transfer, part 2, Izd. ITMO Akad. Nauk BSSR, Minsk, 1981, pp. 166–178.
3. Alifanov, O.M.: Methods for the solution of problems of identification of heat- and mass transfer processes. In: “Mathematical Models, Analytical and Numerical Methods in the Theory of Transfer” (in Russian). Ed. A.A. Samarskii, Izd. ITMO Akad. Nauk BSSR, Minsk, 1982, pp. 79–89.
4. Alifanov, O.M.: Diagnostics and identification of heat-exchange processes (in Russian). In: “Heat- and Mass Transfer-VII”, Problem papers of the VII-th All-Union Conference on Heat- and Mass Transfer, part 2, Izd. ITMO Akad. Nauk BSSR, Minsk, 1985, pp. 117–127.
5. Alifanov, O.M.: Derivation of formulas for the gradient of the error in the iterative solution of inverse problems of heat conduction. I. Determination of the gradient in terms of the Green’s function. *J. Eng. Phys.*, 1987, Vol. 52, No. 3, pp. 352–359.
6. Alifanov, O.M.: Extreme methods in heat transfer problems (in Russian). In “Heat/Mass Transfer-MIF”, Proceedings of the Minsk International Heat and Mass Transfer Forum, Minsk, May 24–27, 1988, Problem papers, Minsk, Izd. ITMO AN BSSR, Minsk, 1988.
7. Alifanov, O.M.: Inverse heat transfer problems (in Russian). Mashinostroenie, Moscow, 1988.
8. Alifanov, O.M.: Inverse problems in the design, modeling and testing of engineering systems. In: Proceeding of the 3-rd International Conference on Inverse Design Concepts and Optimiz. in Eng. Sci. (ICIDES-III), ed. G.S. Dulikravich, Washington, D.C. October 23–25, 1991.
9. Alifanov, O.M.; Artyukhin, E.A.; Pankratov, B.M.: Solution of nonlinear inverse problem of heat conduction. In: “Heat Transfer-Soviet Research” (USA), Vol. 10, No. 3, pp. 63–71, 1978.
10. Alifanov, O.M.; Artyukhin, E.A.: Identification of mathematical model of transient heat transfer processes. In: “Numerical Methods in Thermal Problems”. Proc. 4th Int. Conf., Swansea, July 15–18, Swansea, 1985.
11. Alifanov, O.M.; Artyukhin, E.A.; Nenarokomov, A.V.: Spline approximation of the solution of the inverse heat-conduction problem, taking account of the smoothness of the desired function. *High Temp.* 1987, Vol. 25, No. 4, pp. 520–526.
12. Alifanov, O.M.; Artyukhin, E.A.; Rumyantsev, S.V.: Extremal methods of solving ill-posed problems and their applications to inverse heat transfer problems (in Russian). Nauka, Moscow, 1988.
13. Alifanov, O.M.; Balaboshko, N.G.; Desner, I.G.; Kerov, N.V.; Kuznetsov, V.S.; Pankratov, B.M.: Hardware and software structures for processing thermophysics experiment data. *J. Eng. Phys.*, 1983, Vol. 45, No. 5, pp. 1223–1226.
14. Alifanov, O.M.; Balakovskii, S.L.; Klibanov, M.V.: Reconstruction of causal characteristics of the thermal conductivity process from the solution of the combined inverse problem. *J. Eng. Phys.*, 1987, Vol. 52, No. 5, pp. 617–622.
15. Alifanov, O.M.; Balashova, I.E.: Solving inverse problems of heat transfer with consideration of data on the smoothness of the reconstructed relation (in Russian). *Izv. Sib. Otdel. Akad. Nauk SSSR, Ser. Tech. Nauk*, 1987, Vol. 7, No. 2, pp. 5–11.
16. Alifanov, O.M.; Balashova, I.E.: Investigating the diagnostics algorithms of the thermal effect in design. *J. Eng. Phys.*, 1989, Vol. 56, No. 4, pp. 483–488.

17. Alifanov, O.M.; Mikhailov, V.V.: Solution of the inverse boundary-value problem of heat conduction in an overdefined formulation. *J. Eng. Phys.*, 1983, Vol. 45, No. 5, pp. 1270–1274.
18. Alifanov, O.M.; Nagoga, G.P.; Sapozhnikov, V.M.: Problem of determining internal boundary conditions in measuring the heat of gas-turbine blades undergoing cooling. *J. Eng. Phys.*, 1986, Vol. 51, No. 3, pp. 1040–1045.
19. Alifanov, O.M.; Nenarokomov, A.V.: Effect of different factors on the accuracy of the solution of a parameterized inverse problem of heat conduction. *J. Eng. Phys.*, 1989, Vol. 56, No. 3, pp. 308–312.
20. Alifanov, O.M.; Nenarokomov, A.V.: A three-dimensional inverse heat conduction problem in the extremal statement (in Russian). *Dokl. Russian Akad. Nauk*, 1992, Vol. 325, No. 5, pp. 950–954.
21. Alifanov, O.M.; Rumyantsev, S.V.: Formulas for the discrepancy gradient in the iterative solution of inverse heat-conduction problems. II. Determining the gradient in terms of a conjugate variable. *J. Eng. Phys.*, 1987, Vol. 52, No. 4, pp. 489–495.
22. Alifanov, O.M.; Rumyantsev, S.V.: Gradient of the discrepancy in the iterative solution of inverse heat-conduction problems. III. Calculation of the gradient using a conjugate boundary problem. *J. Eng. Phys.*, 1987, Vol. 52, No. 6, pp. 708–713.
23. Alifanov, O.M.; Rumyantsev, S.V.: Application of iterative regularization for the solution of incorrect inverse problems. *J. Eng. Phys.*, 1987, Vol. 53, No. 5, pp. 1335–1342.
24. Anger, G.: *Inverse problems in differential equations*. Plenum Press, New York, 1990.
25. Artyukhin, E.A.: Optimum planning of experiments in the identification of heat-transfer processes. *J. Eng. Phys.*, 1989, Vol. 56, No. 3, pp. 256–260.
26. Artyukhin, E.A.; Baranov, V.V.; Ganchev, B.G.; Nenarokomov, A.V.: Nonsteady heat-transfer in the wetting of heated surfaces. *High Temp.*, 1987, Vol. 25, No. 5, pp. 719–723.
27. Artyukhin, E.A.; Guseva, L.I.; Tryanin, A.P.; Shibin, A.G.: Data processing and planning of nonstationary thermophysical experiments. *J. Eng. Phys.*, 1989, Vol. 56, No. 3, pp. 286–290.
28. Artyukhin, E.A.; Killikh, V.E.; Nenarokomov, A.V.; Repin, I.V.: Investigation of the thermal interaction of material with two-phase flows by the inverse problem method. *High Temp.* 1990, Vol. 28, No. 1, pp. 94–99.
29. Artyukhin, E.A.; Mamolov, V.A.; Nenarokomov, A.V.: Evaluating the effect of shrinkage on the effective thermal conductivity of a glass-reinforced plastic. *J. Eng. Phys.*, 1989, Vol. 56, No. 6, pp. 707–712.
30. Artyukhin, E.A.; Nenarokomov, A.V.: Inverse problem of deriving the integral emissivity of a solid. *High Temp.*, 1986, Vol. 24, No. 5, pp. 725–729.
31. Artyukhin, E.A.; Nenarokomov, A.V.: Coefficient inverse heat-conduction problem. *J. Eng. Phys.*, 1987, Vol. 53, No. 3, pp. 1085–1090.
32. Balakovskii, S.L.: Resolving power of the iteration method of solving inverse heat conduction boundary value problems. *J. Eng. Phys.*, 1987, Vol. 52, No. 6, pp. 713–717.
33. Balakovskii, S.L.: Solution of inverse heat transfer problems by a two-model method. *J. Eng. Phys.*, 1990, Vol. 57, No. 3, pp. 1118–1122.
34. Balk, P.I.: Practically achievable accuracy and reliability of the solution of inverse heat conduction problems. *J. Eng. Phys.*, 1987, Vol. 52, No. 2, pp. 243–249.
35. Banks, H.T.; Kunisch, K.: *Estimation Techniques for Distributed Parameter Systems*, Birkhäuser, Boston, 1989.
36. Baumeister, J.: *Stable solution of inverse problems*. Vieweg & Sohn, Braunschweig/Wiesbaden, 1987.
37. Baumeister, J.; Reinhardt, H.J.: Inverse heat conduction problems and their numerical solution. In: “Inverse and Ill-posed Problems”, H.W. Engl, C.W. Groetsch (eds.), Academic Press 1987, pp. 325–344.
38. Beck, J.V.: Criteria for comparison of methods of solution of the inverse heat conduction problem. *Nucl. Eng. Des.*, 1979, 5, pp. 11–12.
39. Beck, J.V.; Litkouhi, B.; St. Clair, C.R., Jr.: Efficient sequential solution of the nonlinear inverse heat conduction problem. *Numer. Heat Transfer*, 1982, 5, pp. 275–286.
40. Ben-Haim, Y.; Elias, E.: Indirect measurements of surface temperature and heat flux: optimal design using convexity analysis. *International J. of Heat and Mass Transfer*, Vol. 1987, 30, No. 8, pp. 1673–1683.
41. Blackwell, B.F.: An efficient technique for the numerical solution of the one-dimensional inverse problem of heat conduction. *Numer. Heat Transfer*, 1981, 4, pp. 229–239.
42. Blackwell, B.F.: Some comments of Beck’s solution of the inverse problem of heat conduction through the use of Duhamel’s theorem. *Int. J. Heat and Mass Transfer*, 1983, 26, pp. 302–305.

43. Budnik, S.A.; Guseva, L.T.; Shibin, A.G.: Analysis of the method of temperature measurements used to determine the set of characteristics of a thermally protective coatings. *J. Eng. Phys.*, 1989, Vol. 56, No. 3, pp. 301–308.
44. Cannon, J.; Hornung, U. (Eds.): *Inverse Problems*. Birkhäuser, Basel, 1986.
45. Cannon, J.R.; DuChateau, P.: An inverse problem for an unknown source in a heat equation. *J. Math. Anal. Appl.*, 1980, 75, No. 2, pp. 465–485.
46. Cannon, J.R.; Zachmann, D.: Parameter determination in parabolic partial-differential equations from overspecified boundary data. *Internat. J. Eng. Sci.*, 1982, 20, No. 6, pp. 779–788.
47. Carasso, A.S.: Impulse response acquisition as an inverse heat conduction problem. *SIAM J. Appl. Math.*, 1990, Vol. 50, No. 1, pp. 75–90.
48. Carasso, A.S.: Corrigendum: 'Impulse response acquisition as an inverse heat conduction problem'. *SIAM J. Appl. Math.*, 1990, Vol. 50, No. 3, pp. 942.
49. Chen, H.; Chang, S.: Application of the hybrid method to inverse heat conduction problems. *International J. of Heat and Mass Transfer*, 1990, Vol. 33, No. 4, pp. 621–628.
50. Denisov, A.M.: Uniqueness of the solutions of some inverse problems for the heat equation with a piecewise-constant coefficient. *Zh. Vychisl. Mat. i Mat. Fiz.*, 1982, 22, No. 4, pp. 858–864. Engl. transl. in: *USSR Comput. Math. and Math. Phys.*, 1982, Vol. 22, No. 4.
51. Denisov, V.N.: Stabilization of the solution of the Cauchy problem for the heat equation. *Soviet Math. Dokl.*, 1988, Vol. 37, No. 3, pp. 688–692.
52. Elden, L.: Hyperbolic approximations for a Cauchy problem for the heat equation. *Inverse Problems*, 1988, 4, pp. 59–70.
53. Engl, H.W.; Groetsch, C.W. (Eds.): *Inverse and Ill-posed Problems*. Academic Press, Orlando, 1987.
54. Engl, H.; Langthaler, T.: Numerical solution of an inverse problem connected with continuous casting of steel. *ZOR*, 29 (1985); B, pp. 185–199.
55. Engl, H.; Lanthaler, T.; Manselli, P.: On an inverse problem for a nonlinear heat equation connected with continuous casting of steel. In: "Optimal control with partial differential equations II", K-H. Hoffman, W. Krabs, (eds.), Birkhauser, Basel, 1987, pp. 67–89.
56. Engl, H.; Manselli, P.: Stability estimates and regularization for an inverse heat conduction problem. *Numer. Func. Anal. Optim.* 10 (1989), pp. 517–540.
57. Flach, G.P.; Ozisik, M.N.: Whole domain function-specification method for linear inverse heat conduction. *Annals of Nuclear Energy*, 1986, Vol. 13, No. 6, pp. 325–336.
58. Flach, G.P.; Ozisik, M.N.: Inverse heat conduction of periodically contacting surfaces. *Journal of Heat Transfer, Transactions ASME*, 1988, Vol. 110, No. 4, pp. 821–829.
59. Flach, G.P.; Ozisik, M.N.: Inverse heat conduction problem of simultaneously estimating spatially varying thermal conductivity and heat capacity per unit volume. *Numerical Heat transfer*, 1989, Vol. 16, No. 2, pp. 249–266.
60. Gentili, G.: Dissipativity condition and inverse problems for heat conduction with linear memory: *Inverse Problems*, 1991, Vol. 7, No. 1, pp. 77–84.
61. Gillian, D.S.; Mair, B.A.; Martin, C.F.: An inverse convolution method for regular parabolic equations. *SIAM J. Control Optim.*, 1991, Vol. 29, No. 1, pp. 71–88.
62. Gillian, D.S.; Mair, B.A.; Martin, C.F.: A convolution method for inverse heat conduction problems. *Math. Systems Theory*, 1988, Vol. 21, No. 1, pp. 49–60.
63. Glasko, V.B.; Kulik, N.N.; Tikhonov, A.N.; Shkliano, I.N.: An inverse problem of heat conduction. *USSR Comput. Math. and Math. Phys.*, 1980, Vol. 19, pp. 223–230.
64. Hensel, E.: *Inverse Theory and Applications for Engineers*. Prentice Hall, Englewood Cliffs, New Jersey. 1991.
65. Hensel, E.; Hills, R.: Steady-state two-dimensional inverse heat conduction. *Numerical Heat Transfer, Part B*, 1989, Vol. 15, pp. 227–240.
66. Jarny, Y.; Ozisik, M.N.; Bardou, J.P.: General optimization method using adjoint equation for solving multidimensional inverse heat conduction. *International J. of Heat and Mass Transfer*, 1991, Vol. 34, No. 11, pp. 2911–2919.
67. Kammerer, W.J.; Nashed, M.Z.: On the convergence of the conjugate gradient method for singular linear operator equations. *SIAM J. Numer. Anal.*, 1972, Vol. 9, No. 1, pp. 165–181.
68. Klibanov, M.V.: A uniqueness theorem for a class of inverse thermal-conduction problems involving temperature measurements at internal points. *J. Eng. Phys.*, 1985, Vol. 49, No. 6, pp. 1484–1486.
69. Knabner, P.: Regularizing the Cauchy problem for the heat equation by sign restrictions. In: "Improperly posed problems and their numerical treatment", G. Hammerlin, K.-H. Hoffman (eds.), Birkhäuser 1983, pp. 165–177.

70. Knabner, P.: Regularization of the Cauchy problem for the heat equation by norm bounds. *Appl. Anal.*, 1984, Vol. 17, No. 4, pp. 295–312.
71. Kuroyanagi, T.: Surface temperature and surface heat flux determination of the inverse heat conduction problem. *Bulletin of the JSME*, 1986, Vol. 29, No. 255, pp. 2961–2969.
72. Kurpisz, K.: Method for determining steady state temperature distribution within blast furnace hearth lining by measuring temperature at selected points (in Japanese). *Transactions of the Iron and Steel Institute of Japan*, 1988, Vol. 28, No. 11, pp. 926–929.
73. Kurpisz, K.: Numerical solution of one case of inverse heat conduction problems. *Journal of Heat Transfer, Transactions ASME*, 1991, Vol. 113, No. 2, pp. 280–286.
74. Liu, G.L.: A novel variational formulation of inverse problem of heat conduction with free boundary on an image plane. *Numerical Methods in Thermal Problems*, 1989, Vol. VI, Part 1, 2, Pineridge, Swansea, pp. 1712–1720.
75. Mailliet, D.; Degiovanni, A.; Pasquetti, R.: Inverse heat conduction applied to the measurement of heat transfer coefficient on a cylinder. Comparison between an analytical and a boundary element technique. *Journal of Heat Transfer, Transactions of ASME*, 1991, Vol. 113, No. 3, pp. 549–557.
76. Markin, A.D.; Pyatyskhin, G.G.: Regularization of the solution of the inverse heat conduction problem in a variational formulation. *J. Eng. Phys.*, 1987, Vol. 52, No. 6, pp. 717–721.
77. Marquardt, W.; Auracher, H.: Observer-based solution of inverse heat conduction problems. *International J. of Heat and Mass Transfer*, 1990, Vol. 33, No. 7, pp. 1545–1562.
78. Mehta, R.C.: Extension of the solution of inverse conduction problem. *Int. J. Heat Mass Transfer*, 1979, Vol. 22, pp. 1149–1150.
79. Mishin, V.P.; Alifanov, O.M.: Quality improvement in final design of thermally stressed structures, and inverse heat-transfer problems. 1. General problems of the theory. *Soviet Mashine Science*, 1986, No. 5, pp. 16–25.
80. Mishin, V.P.; Alifanov, O.M.: Improving final designs of thermally stressed structures, and inverse heat-transfer problems. 2. Practical applications. *Soviet Mashine Science*, 1986, No. 6, pp. 8–16.
81. Morozov, V.A.: *Methods for Solving Incorrectly Posed Problems*. Springer-Verlag, New York, 1984.
82. Murio, D.A.: Parameter selection by discrete mollification and the numerical solution of the inverse heat conduction problem. *J. Comp. Appl. Math.*, 1988, Vol. 22, pp. 25–34.
83. Murio, D.A.: The mollification method and the numerical solution of the inverse heat conduction problem by finite differences, *Computers Math. Applic.*, 1989, Vol. 17, No. 10, pp. 1385–1396.
84. Murio, D.A.; Guo, L.: A stable marching finite difference algorithm for the inverse heat conduction problem with no initial filtering procedure. *Computers Math. Applic.*, 1990, Vol. 19, No. 10, pp. 35–50.
85. Muzylev, N.V.: Uniqueness of the determination of the temperature dependence of thermo-physical properties in piecewise monotonic processes. *J. Eng. Phys.*, 1985, Vol. 49, No. 6, pp. 1487–1490.
86. Nashed M.Z.: Steepest descent for singular linear operator equations. *SIAM J. Numer. Anal.*, 1970, Vol. 7, No. 3, pp. 358–362.
87. Nashed, M.Z.: On nonlinear ill-posed problems 1: Classes of operator equations and minimization of functionals. In: “Nonlinear Analysis and Applications” (V. Lakshmikantham, Ed.), Dekker, New York, 1987, p. 351–373.
88. Palancz, B.; Szabolcs, G.: Solution of inverse heat conduction problem by orthogonal collocation techniques. *Acta Technica, Budapest*, 1988, Vol. 101, No. 3, pp. 323–337.
89. Prosuntsov, P.V.; Reznik, S.V.: Problems of heat transfer in semitransparent scattering materials. 1. The theoretical fundamentals of the absolute stationary method for determination of thermal conductivity (in Russian). *Sib. Fiz.-Tekhn. Zh. (Izv. Sib. Otd. Russ. Akad. Nauk)*, 1991, Iss. 1, pp. 51–56.
90. Prosuntsov, P.V.; Reznik, S.V.; Tyutyunnik, V.E.: Problems of heat transfer in semitransparent scattering materials. 2. The experimental facility and results of investigating thermal conductivity by the absolute stationary method (in Russian). *Sib. Fiz.-Tekhn. Zh. (Izv. Sib. Otd. Russ. Akad. Nauk)*, 1992, Iss. 4, pp. 27–32.
91. Prosuntsov, P.V.; Reznik, S.V.: Problems of heat transfer in semitransparent scattering materials. 3. The theoretical fundamentals of determination of thermal conductivity by the method of monotonous heating (in Russian). *Sib. Fiz.-Tekhn. Zh. (Izv. Sib. Otd. Russ. Akad. Nauk)*, 1992, Iss. 4, pp. 33–38.

92. Raynaud, M.: Comparison of space marching finite difference technique and function minimization technique for the estimation of the front location in nonlinear melting problems. Fifth Symposium on Control of Distributed Parameter Systems, A. El Jai and M. Amroux (eds.), Université de Perpignan, France, 1989, pp. 215–220.
93. Raynaud, M., Bransier, J.: A new finite difference method for nonlinear inverse heat conduction problem. *Numerical Heat Transfer*, 1986, Vol. 9, No. 1, pp. 27–42.
94. Raynaud, M.; Beck, J.V.: Methodology for comparison of inverse heat conduction methods. *Transactions of the ASME*, 1988, Vol. 110, pp. 30–37.
95. Reemtsen, R.; Kirsch, A.: A method for the numerical solution of the one-dimensional inverse Stefan problem. *Numer. Math.*, 1984, Vol. 43, pp. 253–273.
96. Reinhardt, H.J.: Numerical method for the solution of two-dimensional inverse heat conduction problem. *International J. for Numerical Methods in Engineering*, 1991, Vol. 32, No. 2, pp. 363–383.
97. Reinhardt, H.-J.; Valensia, L.: The numerical solution of inverse heat conduction problems with application to reactor technology. In: "Structural Mechanics in Reactor Technology (9th SMLPL-Conf., Lausanne). 1987, Ed. F.H. Wittman, Vol. B, pp. 25–29.
98. Scott, E.P.; Beck, J.V.: Analysis of order of the sequential regularization solutions of inverse heat conduction problems. *Journal of Heat Transfer, Transactions ASME*, 1989, Vol. 111, No. 2, pp. 218–224.
99. Shoji, M.; Ono, N.: Application of the boundary element to the inverse problem of heat conduction (in Japanese). *Nippon Kikai Gakkai Ronbunshu, B Hen*, 1988, Vol. 54, No. 506, pp. 2893–2900.
100. Sun, X., Jaggard, D.L.: The inverse black body radiation problem: a regularized solution. *Journal of Applied Physics*, 1987, Vol. 62, No. 11, pp. 4382–4386.
101. Talenti, G. (Ed.): *Inverse Problems*. LNM 1225, Springer-Verlag, New York, 1986.
102. Tandy, D.F.; Trujillo, D.M.; Busby, H.R.: Solution of inverse heat conduction problems using an eigenvalue reduction technique. *Numerical Heat Transfer*, 1986, Vol. 10, No. 6, pp. 597–617.
103. Tikhonov, A.N.; Goncharsky, A.V. (Eds): *Ill-posed Problems in the Natural Sciences*. MIR, Moscow, 1989.
104. Weiland, E.; Babary, J.P.: Comparative study for a new solution to the inverse heat conduction problem. *Comm. in Applied Numerical Methods*, 1988, Vol. 4, No. 5, pp. 687–689.
105. Williams, S.D.; Curry, D.M.: An analytical experimental study for surface heat flux determination. *J. Spacecraft*, 1977, Vol. 14, pp. 632–637.
106. Woodbury, K.: Effect of thermocouple sensor dynamic on surface heat flux predictions obtained via inverse heat transfer analysis. *Int. J. of Heat and Mass transfer* 1990, Vol. 33, No. 12, pp. 2641–2649.
107. Woodbury, K.A.: Determination of Surface Heat Fluxes During Spray Quenching of Aluminum Using an Inverse Technique. ASME Paper No. 91-WA-HT-12, Winter Annual Meeting, 1991, Atlanta, Georgia.
108. Yoshimura, T.; Ikuta, K.: Inverse heat conduction problem by finite element formulation. *Int. J. Systems Sci.*, 1985, Vol. 16, pp. 1365–1376.
109. Zabarar, N.: Inverse Finite element techniques for the analysis of solidification processes. *International J. for Numerical Methods in Engineering*, 1990, Vol. 29, No. 7, pp. 1569–1587.
110. Zabarar, N.; Liu, J.C.: An analysis of two-dimensional linear inverse heat transfer problems using an integral method. *Numer. Heat Transfer*, 1990, Vol. 13, pp. 527–533.
111. Zabarar, N.; Mukherjee, S.; Richmond D.: An analysis of inverse heat transfer problems with phase changes using an integral method. *ASME J. of Heat Transfer*, 1988, Vol. 110, pp. 554–561.

Subject Index

- a priori information account 262, 264, 268, 271, 294, 310, 315, 318, 331
- absence of continuous dependence 48
- algorithm 158, 196
 - difference 125, 128
 - finite-difference 124
 - iterative 154, 229
 - regularizing 68, 229
- approximation 325
 - automation 206
 - differential 137, 138
 - mean square 231, 305, 325
 - – piecewise-constant 97, 316
 - – piecewise-linear 204
 - – step 105, 118, 239
 - time 138
- artificial hyperbolization 147
- body
 - semi-infinite 109
- boundary
 - fictitious 52
 - – method of 52, 70, 91, 92, 95, 239
 - moving 71, 74, 91, 97, 219
 - travelling 240, 255, 285
 - value problem 150, 252, 255, 258, 259, 288, 296
 - – statement 36, 37, 96, 115, 117
- Cauchy
 - form 36
 - inequality 230, 242
 - problem 54, 143, 219
 - – uniqueness of 54
 - statement 38, 53, 65, 84, 87, 91, 131, 141, 145
- causal characteristics 9, 11–13, 15, 17
- cause-and-effect relationship 9, 10
- characteristics
 - causal 27, 58
 - effect 27
- class of correctness 58
- coefficient inverse problem 25–27
- compact set 58, 59
- condition
 - Hölder 56
 - solvability 35
 - uniqueness 35
- conditionality 39, 103, 106, 133, 311
 - of the problem 294
- continuity
 - Hölder 82
- convergence 271, 290, 316–318
 - inner 206, 217
 - uniform 178, 213, 231, 262, 266, 267, 293
- cooling system
 - porous 18, 24
- criterion
 - halt 155
 - residual 312
- critical value of calculation interval 107
- data
 - initial 68
 - input 311, 313
- density 47, 72, 83, 85–87
- descent
 - admissible direction 157, 162
 - depth 160, 167, 190
 - steepest 173, 174, 181, 229, 270, 282, 316
- determination 295
- distribution 251
- Duhamel's form 53
- Duhamel's principle 98
 - eigenvalue 103, 116, 202
- equation
 - difference 145
 - Euler 39, 194, 196–199
 - integral 37, 45, 46, 80, 95, 193
 - Fredholm 40, 84, 90, 95, 197, 198
 - homogeneous 76
 - hyperbolic 138, 147
 - nonhomogeneous 76
 - of the first kind 37
 - of the second kind 37
 - one-dimensional 71
 - Volterra 37, 40, 44, 47, 70, 73, 74, 84, 86, 90, 95
 - Volterra-Fredholm 70
- error 193, 205, 311
- Euclidean metric 156
- experiment design 228, 322

- formula
 - discontinuity 73, 83
 - Newton's tangents 207
 - Ostrogradsky 189
 - recurrent 98
 - transition 86
- formulation
 - extremal 150
- Fourier number 104, 107, 109, 111, 115
- Frechet derivative 162, 163, 241, 242, 244, 271
- function
 - increment 188
 - influence 55, 77, 79, 94, 109–111, 117
 - weight 235, 252
- functional 153, 161, 185, 236, 252, 255, 263
 - criterion 235, 237, 246, 269, 283, 290
 - optimization 161, 162
 - regularizing 201, 218, 222, 225
 - residual 39, 187, 233, 241, 255, 282, 292, 296
 - smoothing 68, 200, 213
 - stabilizing 68, 199
- gradient 157, 161–163, 170, 185, 233, 236, 238, 242, 249, 250, 253–255, 259–261, 264, 265, 268–272, 275, 280, 284, 298, 299
 - conjugate 174, 181, 229, 320
 - functional 171, 190, 237, 239, 278, 288, 291, 297, 319
 - of residual 248
- Green's function 45, 55, 70, 80, 92, 120, 199, 232, 233, 239, 244, 272, 273, 281, 319
- heat
 - condition equation 126
 - conduction 11, 35, 138, 231
 - – equation 17, 41, 43, 49–52, 81, 131, 133, 151, 217, 219, 240, 330
 - – equation system for
- generalized problem 11, 13, 43, 108
 - – geometric inverse problem 46
 - – retrospective problem 45
 - diagnostic 20
 - diagnostic of non-stationary 3
 - flux sensor 20
 - release 22
 - transfer
 - – coefficient 13, 20
 - – coefficient of convection 21
 - – combined 16
 - – conductive-radiative 18
 - – convective 14
 - – diagnostic 21
 - – in engineering systems 17
 - – inverse 47
 - – radiation 14
 - – problem 9
 - – direct 9, 17
 - – inverse 9, 14, 16, 25, 259
- heating regime
 - regular 60
- hyperbolization
 - artificial 147
- identification
 - parametric 9
 - structural 9
- IHCP 28
 - algorithm 174, 329
 - boundary 231, 330
 - – solution 34, 50, 52
 - Cauchy formulation 218
 - coefficient 291, 321
- conditionality 92
 - difference method 124
 - integral
 - – algebraic solution 119
 - – three-dimensional 81
 - – two-dimensional 89
 - natural regularization 137
 - numerical solution 127
 - retrospective 231
 - solution 144, 241
 - stability 104, 150
 - two-dimensional 225, 319
- ill
 - conditioned 103
 - posed 39, 45, 56
- incorrectness 40
- increment 104, 164, 185, 257
 - critical 107
- in temperature 172, 242, 261
- instability 44, 73, 181
 - physical explanation 42
- integral
 - Duhamel 36, 71, 93
 - equation 37, 71
 - form 37, 71
 - Fredholm 41
 - representation 70
 - three-dimensional 81
 - Volterra 77
- inversion
 - one-fold 122
- iteration 160
 - stoppage 166, 230, 278, 301, 304, 313, 320
- iterative process 156, 163, 166, 177, 182, 317
 - geometric interpretation 157
- Kalman
 - method 66
 - recurrent linear estimation 48

- kernel 37, 54–56, 71, 98, 106, 109–113, 115, 118, 121, 139, 140, 193
- Kirchoff
 - model temperature 71
 - substitution 44
 - transformation 73, 163, 184
- Kowalski theorem 54
- Lagrange
 - functional 259
 - identity 246
- level
 - admissible 166, 173, 175
 - – minimization 155
- Lyapunov surface 83
- mapping
 - inverse 58
- matrix
 - ill conditioned 103
 - inverse 98, 103, 104
 - triangular 98, 121, 129
- method
 - algebraic solution 97
 - alternating-direction 325
 - difference 130
 - differential 75
 - direct 7, 29, 65, 96
 - – approximate-analytical 330
 - – numerical 330
 - finite-difference 124
 - Fourier 116
 - functional specification 319
 - Gaussian elimination 128
 - gradient 150, 158, 159, 181
 - – conjugate 163, 168, 173, 266, 267, 269, 293, 296, 310
 - Green's functions 71
 - Holmgren 56
 - iterative regularization 330
 - Kalmann 66
 - Lagrange multiplier 194, 255
 - Neumann 146
 - Newton type 169, 218
 - Newton's optimization 169
 - numerical 124, 143
 - of least squares 48
 - of point error 106
 - of regularization by Tikhonov 118
 - problem-oriented 29
 - regularization 196, 215
 - – regularized algebraic 330
 - – regularized numerical 330
 - steepest descent 158, 162, 265, 267, 271
 - Tikhonov 66, 92
 - universal 29
 - variational 35, 68
- model
 - mathematical (MM) 8
 - temperature 163, 179
- norm 134, 195, 228, 271
 - Euclidean 156
 - of space 290, 316
- operator
 - adjoint 199, 233, 234, 236, 237, 241, 242, 248, 281
 - equation 35, 228
 - family 229
 - form 193
 - inverse 58
 - linear 203
 - regularizing 67, 68
- optimization
 - functional 150
 - parametric 150, 155
- point error technique 135
- potential 84–86
 - density 73, 74, 87
 - thermal 47, 72, 74, 81–83, 85, 86, 89, 90, 193, 239
- problem
 - adjoint 164, 171, 188, 250, 251, 261, 254, 287, 298
 - boundary 11, 239
 - – inverse 13, 50
 - coefficient 11
 - – inverse 45
 - direct 36, 79
 - – conduction 79
 - finite-difference solution 129
 - geometric 11
 - ill-posed 11
 - inverse 3, 10, 11, 48–50, 78, 89
 - difference solution 129
 - of Sturm-Liouville 116
 - pseudo-inverse 34, 56, 108
 - retrospective 11
 - unstable 46
 - well-posed 57
- programming
 - non-linear 156
- quantity 167
- recoverability
 - of boundary condition 102
- recurrent 97
 - calculation 122
 - expression 122

- recurrent
 - technique 130
- regular regime 5
- regularization 61
 - by-interval 215
 - by series truncation 63
 - by Tikhonov method 6, 34, 62, 192
 - form 193, 225
 - heuristic 7
 - iterative 6, 35, 69, 153, 191, 227
 - natural 34, 63, 65, 118
 - step 7
 - step-type technique 96
 - self 34, 62, 166
 - parameter 166, 192, 204, 218, 229
 - principle 191
 - step 34, 62–65, 96, 103, 105, 122–124, 141
- relaxation time
 - fictitious 138, 147
- renewal 230
- residual 64, 152, 164, 169, 186, 193, 205, 216, 233, 260
 - criteria 305
 - level 155, 186, 216
 - mean-square 167
 - principle 218, 223
 - weighted 119, 205
- response 156
- scheme
 - difference 215
 - explicit 131, 133, 143
 - implicit 143, 179, 218, 299
 - T-type 135
 - viscosity 137
- sensing elements (SE) 20–22
- sensor 22
- sequence 159
 - iterative 162
- simulation 8
- smoothing 153
 - of initial data 280, 331
 - pre- 182
- smoothness 268, 271, 284, 310, 316, 320
 - of resultant function 264
 - of solution 203, 255, 269, 271
- space 235, 239, 262, 269, 271–273, 275–278, 287, 288, 291, 300, 309, 310, 312, 313, 316–319
 - C 59, 60
 - C^1 54, 83
 - C^2 54, 83
 - C^k 83
 - coordinates 187
 - Euclidean XI, 48, 201, 202
 - functional 162
 - Hilbert 193, 228, 242
 - real-valued functions $L_2[a, b]$ XI, 49
 - Sobolev XI, 67, 194
- spline 322
 - approximation 323
 - B-spline 156, 277, 289, 292
 - cubic 118
- square
 - least 66
- stability 36, 106, 107, 115, 133, 173, 175
 - condition 146
 - of a finite-difference scheme 133
 - of the difference solution 136
 - weak 134, 142, 146
- statement
 - admissible 138, 143
 - approximation 118
 - conditionally-well-posed 57, 58, 60, 61
 - critical 109
 - descent 291
 - length 156, 284, 293
 - regularized 200
 - size of 158
 - two-dimensional 119
 - variational 39
 - step 119, 157–159, 170, 171, 190, 275, 289
- surface
 - response 156
- superposition 41, 101, 215
 - principle 71, 76, 93, 116
- temperature field
 - increment 283, 286, 289, 293, 296
 - numerical continuation 131, 217
 - variation 254
- temperature wave 42
- testing technique
 - comparative 21
- thermal
 - design 27
 - mode 64
- thermodestruction 240
- three-sigma rule 209, 214
- Titchmarch's theorem 53
- truncating a series 62
- value
 - admissible 105