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Nota di contenuto	1 Multiphase Flow Splitting in Looped Pipelines -- 2 Green's Function Decomposition Method for Transport Equation -- 3 Integral Neutron Transport and New Computational Methods: A Review -- 4 Scale Invariance and Some Limits in Transport Phenomenology: Existence of a Spontaneous Scale -- 5 On Coherent Structures from a Diffusion-Type Model -- 6 Numerical Simulation of the Dynamics of Molecular Markers Involved in Cell Polarization -- 7 Analytical Study of Computational Radiative Fluxes in a Heterogeneous Medium -- 8 A Novel Approach to the Hankel Transform Inversion of the Neutron Diffusion Problem Using the Parseval Identity -- 9 What Is Convergence Acceleration Anyway? -- 10 On the Fractal Pattern Phenomenology of Geological Fracture Signatures from a Scaling Law -- 11 Spectral Boundary Homogenization Problems in Perforated Domains with Robin Boundary Conditions and

Large Parameters -- 12 A Finite Element Formulation of the Total Variation Method for Denoising a Set of Data -- 13 On the Convergence of the Multi-Group Isotropic Neutron LTSN Nodal Solution in Cartesian Geometry -- 14 Numerical Integration with Singularity by Taylor Series -- 15 Numerical Solutions of the 1D Convection–Diffusion–Reaction and the Burgers Equation Using Implicit Multi-Stage and Finite Element Methods -- 16 Analytical Reconstruction of Monoenergetic Neutron Angular Flux in Non-multiplying Slabs Using Diffusion Synthetic Approximation -- 17 On the Fractional Neutron Point Kinetics Equations -- 18 On a Closed Form Solution of the Point Kinetics Equations With a Modified Temperature Feedback -- 19 Eulerian Modeling of Radionuclides in Surficial Waters: The Case of Ilha Grande Bay (RJ, Brazil) -- 20 Fractional Calculus: Application in Modeling and Control -- 21 Modified Integral Equation Method for Stationary Plate Oscillations -- 22 Nonstandard Integral Equations for the Harmonic Oscillations of Thin Plates -- 23 A Genuine Analytical Solution for the SN Multi-Group Neutron Equation in Planar Geometry -- 24 Single-Phase Flow Instabilities: Effect of Pressure Waves in a Pump–Pipe–Plenum–Choke System -- 25 Two-Phase Flow Instabilities in Oil Wells: ESP Oscillatory Behavior and Casing-Heading -- 26 Validating a Closed Form Advection–Diffusion Solution by Experiments: Tritium Dispersion after Emission from the Brazilian Angra Dos Reis Nuclear Power Plant -- Index.

Sommario/riassunto

Advances in science and technology are driven by the development of rigorous mathematical foundations for the study of both theoretical and experimental models. With certain methodological variations, this type of study always comes down to the application of analytic or computational integration procedures, making such tools indispensable. With a wealth of cutting-edge research in the field, *Integral Methods in Science and Engineering: Progress in Numerical and Analytic Techniques* provides a detailed portrait of both the construction of theoretical integral techniques and their application to specific problems in science and engineering. The chapters in this volume are based on talks given by well-known researchers at the Twelfth International Conference on Integral Methods in Science and Engineering, July 23–27, 2012, in Porto Alegre, Brazil. They address a broad range of topics, from problems of existence and uniqueness for singular integral equations on domain boundaries to numerical integration via finite and boundary elements, conservation laws, hybrid methods, and other quadrature-related approaches. The contributing authors bring their expertise to bear on a number of topical problems that have to date resisted solution, thereby offering help and guidance to fellow professionals worldwide.

Integral Methods in Science and Engineering: Progress in Numerical and Analytic Techniques will be a valuable resource for researchers in applied mathematics, physics, and mechanical and electrical engineering, for graduate students in these disciplines, and for various other professionals who use integration as an essential tool in their work.
