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Bibliography

3. Finite element methods for fractional differential equations Changpin Li and Fanhai Zeng 3.1 Introduction; 3.2 Preliminaries and notations; 3.3 Finite element methods for fractional differential equations; 3.4 Conclusion; Bibliography; 4. Fractional step method for the nonlinear conservation laws with fractional dissipation Can Li and Weihua Deng; 4.1 Introduction; 4.2 Fractional step algorithm; 4.2.1 Discretization of the fractional calculus; 4.2.2 Discretization of the conservation law; 4.3 Numerical results; 4.4 Concluding remarks; Bibliography; 5. Error analysis of spectral method for the space and time fractional Fokker-Planck equation Tinggang Zhao and Haiyan Xuan 5.1 Introduction; 5.2 Preliminaries; 5.3 Spectral method; 5.4 Stability and convergence; 5.4.1 Semi-discrete of space spectral method; 5.4.2 The time discretization of Caputo derivative; 5.5 Fully discretization and its error analysis; 5.6 Conclusion remarks; Bibliography; 6. A discontinuous finite element method for a type of fractional Cauchy problem Yunying Zheng; 6.1 Introduction; 6.2 Fractional derivative space; 6.3 The discontinuous Galerkin finite element approximation; 6.4 Error estimation; 6.5 Numerical examples; 6.6 Conclusion; Bibliography; 7. Asymptotic analysis of a singularly perturbed parabolic problem in a general smooth domain Yu-Jiang Wu, Na Zhang and Lun-Ji Song; 7.1 Introduction; 7.2 The curvilinear coordinates; 7.3 Asymptotic expansion; 7.3.1 Global expansion; 7.3.2 Boundary corrector; 7.3.3 Estimates of the solutions of boundary layer equations; 7.4 Error estimate; 7.5 An example; Bibliography; 8. Incremental unknowns methods for the ADI and ADSI schemes Ai-Li Yang, Yu-Jiang Wu and Zhong-Hua Yang

Sommario/riassunto

Nonlinear dynamics is still a hot and challenging topic. In this edited book, we focus on fractional dynamics, infinite dimensional dynamics defined by the partial differential equation, network dynamics, fractal dynamics, and their numerical analysis and simulation. Fractional dynamics is a new topic in the research field of nonlinear dynamics which has attracted increasing interest due to its potential applications in the real world, such as modeling memory processes and materials. In this part, basic theory for fractional differential equations and numerical simulations for these equations w