



Fractal and Fractional

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Advances in Fractional Modeling and Computation

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Fractional calculus is a mathematical discipline concerned with the study of derivatives and integrals of non-integer order. In recent decades, fractional calculus has attracted increasing attention due to its wide range of applications in physics, engineering, finance, and biology. It provides powerful tools for modeling complex systems exhibiting nonlocal behavior, memory effects, and long-range interactions, as well as for formulating and analyzing differential equations involving fractional operators. However, many mathematical models of complex systems formulated in terms of ordinary and partial fractional differential equations do not admit closed-form analytical solutions. Consequently, there is a pressing need to develop accurate, stable, and efficient computational methods for the solution and analysis of fractional-order models.

The focus of this reprint is on the development and advancement of mathematical models based on fractional differential equations and stochastic processes. It presents original research articles addressing theoretical foundations, numerical and computational methodologies, and practical applications of fractional models in physics, chemistry, biology, engineering, and economics.



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