fractal and fractional

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New Aspects of Local Fractional Calculus

Guest Editors:

Dr. Dimiter Prodanov
EHS and NERF, Interuniversity Microelectronics Center (imec), 3001 Leuven, Belgium; IICT, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria

dimiter.prodanov@imec.be

Prof. Dr. Dumitru Baleanu
1. Institute of Space Sciences, P.O. Box MG-23, RO-077125 Magurele-Bucharest, Romania
2. Department of Mathematics, Cankaya University, Ankara 06530, Turkey

dumitru@cankaya.edu.tr

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Message from the Guest Editors

Dear Colleagues,

Interest in fractal and non-differentiable functions was rekindled with the works of Mandelbrot in fractals, where such fractal objects were used to model natural phenomena, such as the coast of Britain. In the broad sense of understanding, local fractional calculus evolved from several distinct perspectives: firstly, this was the study of localized versions of the classical fractional derivatives; secondly, it was formulated in terms of difference quotients defined as fractional velocities, with physical applications in mind; and thirdly, it was developed as an extension of the ordinary calculus for functions defined on Cantor sets. The local fractional calculus can be used to characterize the growth of singular functions, and it was applied to problems in stochastic mechanics and in general to strongly non-linear phenomena, which are difficult to describe through smooth mathematical objects.

We invite and welcome review, expository, and original research articles dealing with the recent advances in the theory of local fractional derivatives on Cantor sets, fractional velocities, fractal integral operators, and their multidisciplinary applications.