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Title:	Random walk and broad distributions on fractal curves
Authors:	Satin, S. (/jspui/browse?type=author&value=Satin%2C+S.) Gangal, A.D. (/jspui/browse?type=author&value=Gangal%2C+A.D.)
Keywords:	Fractal curve Random walk Probability distributions First passage time
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Abstract:	A first principles approach is developed in this article to address basic mathematical structure of random walks with exact results for a stochastic analysis on a fractal curve. We present this analysis using a recently developed calculus for a fractal geometry. Restricting to unbiased random walk on a fractal curve, we find out the corresponding probability distribution which is gaussian like in nature, but shows deviation from the standard behaviour. Moments are calculated in terms of Euclidean distance for a von Koch curve. We also include analysis on Levy distributions for the same fractal structure and demonstrate that the dimension of the fractal curve shows significant contribution to the distribution law by modifying the nature of moments. Towards the end of the article, the first passage time for random walks on the fractal is presented. The appendix gives a short note on Fourier transform for fractal curves and a very brief introduction to the F_α -calculus.
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