KENDALL RANDOM WALKS

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Abstract: The paper deals with a new class of random walks strictly connected with the Pareto distribution. We consider stochastic processes in the sense of generalized convolution or weak generalized convolution. The processes are Markov processes in the usual sense. Their structure is similar to perpetuity or autoregressive model. We prove the theorem which describes the magnitude of the fluctuations of random walks generated by generalized convolutions.

We give a construction and basic properties of random walks with respect to the Kendall convolution. We show that they are not classical Lévy processes. The paper proposes a new technique to cumulate the Pareto-type distributions using a modification of the Williamson transform and contains many new properties of weakly stable probability measure connected with the Kendall convolution. It seems that the Kendall convolution produces a new class of heavy tailed distributions of Pareto-type.

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