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Arbitrary Truncated Levy Flight: Asymmetrical Truncation and High-Order Correlations

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The generalized correlation approach, which has been successfully used in statistical radio physics to describe non-Gaussian random processes, is proposed to describe stochastic financial processes. The generalized correlation approach has been used to describe a non-Gaussian random walk with independent, identically distributed increments in the general case, and high-order correlations have been investigated. The cumulants of an asymmetrically truncated Levy distribution have been found. The behaviors of asymmetrically truncated Levy flight, as a particular case of a random walk, are considered. It is shown that, in the Levy regime, high-order correlations between values of asymmetrically truncated Levy flight exist. The source of high-order correlations is the non-Gaussianity of the increments: the increment skewness generates threefold correlation, and the increment kurtosis generates fourfold correlation.

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