



Power-law truncated Lévy flights

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Truncated Lévy flights are stochastic processes which display a crossover from a heavy-tailed Lévy behavior to a faster decaying probability distribution function (pdf). Putting less weight on long flights overcomes the divergence of the Lévy distribution second moment. We introduce a fractional generalization of the diffusion equation, whose solution defines a process in which a Lévy flight of exponent α is truncated by a power-law of exponent $5-\alpha$. A closed form for the characteristic function of the process is derived. The pdf of displacement slowly converges to a Gaussian in its central part showing however a power-law far tail. Possible applications are discussed.