

ASYMPTOTIC PROPERTIES OF LÉVY WALKS

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Levy walks are useful models of anomalous diffusion and have found a number of applications in physics and biology. We present some results regarding properties of their limit processes in a ballistic regime. We will focus on probability distributions and aging property. In particular we will show that despite a complicated memory structure and the appearance of α -stable processes in the definition of the limit process its probability density function is given by an elementary function in a 3D case. In 2D the result for PDF is more complicated and it requires a fractional derivative and hypergeometric functions. We also discuss a simulation algorithm for these processes. It turns out that there is a perfect agreement between statistics obtained via Monte Carlo simulations and our theoretical findings. Some results concerning path properties of the limit processes will be discussed as well.

REFERENCES

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