Non-Poissonian run-and-turn motions FRANCOIS DETCHEVERRY, University of Lyon, CNRS — Swimming bacteria exhibit a variety of motion patterns (run-and-tumble, run-reverse, run-reverse-flick), in which persistent runs are punctuated by sudden turning events. What are the properties of such random motions? If a complete answer has been given when the turning events follow a Poisson process, it has remained elusive outside this particular case. We present a generic framework for such non-Poissonian run-and-turn random motions. We obtain the generating function of moments by building on the framework of continuous time random walks and using non-commutative calculus. The approach is applied to a bimodal model of persistent motion that is directly applicable to swimming patterns and cell motility.

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