

Abstract Submitted
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Dynamical Mueller's Ratchet: Population Size Dependence of Evolutionary Paths in Bacteria DIRK LORENZ, Department of Physics and Astronomy, Rice University, JEONG-MAN PARK, Department of Physics, The Catholic University of Korea, MICHAEL DEEM, Departments of Physics and Astronomy and Bioengineering, Rice University, MICHAEL DEEM TEAM — Experimental evolution has recently enabled the complete quantitative description of small-dimensional fitness landscapes. Quasispecies theory allows the mathematical modeling of evolution on such a landscape. Typically, analytic solutions for these models are only exactly solvable for the case of an infinite population. Here we use a functional integral representation of population dynamics and solve it using the Schwinger Boson method. This allows us to compute the first-order correction to the average fitness for finite populations. We will use these results to explain the experimental observations of dynamics of evolution in finite populations.

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