

Abstract Submitted
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Evolution on a Lattice under Strong Mutation¹ JAKUB OTWINOWSKI, STEFAN BOETTCHER, Emory University — The most common approach to study biological evolution in a population considers mutations to arise one at a time, and spread to the whole population. However, recent experimental work has shown that under conditions of strong mutation and strong selection, multiple mutations may arise simultaneously. Such overlapping mutations compete with each other and make the results difficult to analyse. Theorists are working on understanding the relationships between different parameters such as population size, mutation rate, and selection coefficients, in the way they affect observables such as the speed of evolution, and the probability of fixation. We have shown with simulations that under additional spatial constraints the dynamics are very different compared to well-mixed populations. A surface in fitness space evolves, akin to surface growth phenomena, with non-trivial power-law exponents. The result is that the speed of evolution is restricted and the probability of fixation is reduced.

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