Diffusion and Selection in Many-Allele Range Expansions BRYAN WEINSTEIN, Harvard University, MAXIM LAVRENTOVICH, University of Pennsylvania, WOLFRAM MÖBIUS, Eindhoven University of Technology, ANDREW MURRAY, DAVID NELSON, Harvard University — We experimentally and numerically investigate the evolutionary dynamics of four competing strains of *E. coli* with differing growth rates in a range expansion. We model the population as a one-dimensional line of annihilating and coalescing random walkers with deterministic biases due to selection. We compare experimental measurements of the average fraction, two-point correlation functions, and relative annihilation and coalescence rates to simulation by matching a set of dimensionless parameters that collapses the dynamics of the competing strains. The model reasonably predicts our experimental population dynamics. We find that our domain boundaries fluctuate superdiffusively per length expanded L as $L^{1.66\pm0.05}$. Our work acts as a starting point to describe the dynamics of clonal interference in spatially structured populations when multiple mutations have arisen conferring different selective advantages to subsets of a population.

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