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**Fluctuation-regularized front propagation dynamics in reaction-diffusion systems<sup>1</sup>**

DAVID KESSLER, Bar-Ilan University

We introduce and study a new class of fronts in finite particle number reaction-diffusion systems, corresponding to propagating up a reaction rate gradient. We show that these systems have no traditional mean-field limit, as the nature of the long-time front solution in the stochastic process differs essentially from that obtained by solving the mean-field deterministic reaction-diffusion equations. Instead, one can incorporate some aspects of the fluctuations via introducing a density cutoff. Using this method, we derive analytic expressions for the front velocity dependence on bulk particle density and show self-consistently why this cutoff approach can get the correct leading-order physics.

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