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Transport in Disordered Reaction-Diffusion Systems ANDREW MISSEL, KARIN DAHMEN, University of Illinois, Urbana-Champaign — The effects of quenched spatial disorder in the reaction rates on the behavior of reaction-diffusion (RD) models have been difficult to discern, but understanding these effects is essential for predicting the behavior of any real system reasonably well-described by such a model. We present here a step towards an understanding of these effects on transport in RD systems, taking as our model a 1D system in which particles compete ($2A \to A$) and diffuse with spatially homogeneous rates, reproduce ($A \to 2A$) on certain sites ("oases"), and die ($A \to 0$) on all others. We show that predictions from a simplified linear model for the first passage properties between two oases match the results of Monte Carlo simulations; these results, along with some ideas from percolation theory, can be used to make some predictions about the nature of transport across a disordered (many oases) system in higher dimensions.

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