

Abstract Submitted
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Anomalous Dimension in a Two-Species Reaction-Diffusion

Model JOSHUA HELLERICK, BENJAMIN VOLLMAYR-LEE, Bucknell University — We consider particles (A) diffusing in the presence of traps (B), which themselves are diffusing and reacting, i.e. the two-species reaction diffusion model $A + B \rightarrow B$ and $B + B \rightarrow (0, B)$. We introduce a simulation technique that provides the full probability distribution of particles for a given realization of the trap dynamics. Previous renormalization group analysis predicted that the density of A particles decays as $a t^{-\theta}$ where θ is a nontrivial, universal exponent for $d < 2$. We compare our results with these predictions, and also demonstrate the scaling of the correlation functions. We discover an anomalous dimension in the particle-particle correlation function, described by $G_{AA}(0) \sim t^\phi$, and we report our measurements for this new exponent.

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