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Renormalization Group Calculation of Anomalous Dimension in the Trapping Reaction BENJAMIN VOLLMAYR-LEE, Bucknell University, JACK HANSON, City College of New York, SCOTT MCISAAC, Calico Labs, JOSHUA HELLERICK, Bucknell University — We consider the trapping reaction $A + B \to B$, with diffusing particles (A) and traps (B), where the traps additionally undergo either an annihilation ($B + B \to \emptyset$) or coalescence ($B + B \to B$) reaction. This two-species reaction-diffusion system exhibits asymptotic power law decays in both the trap and particle densities, and simple scaling in the trap-trap and particle-trap correlation functions. However, simulations indicate the induced particle-particle correlations scale as $C_{AA}(x,t) = t^{\phi} f(x/t^{1/2})$ with an anomalous dimension ϕ. We perform a one-loop renormalization group calculation of this exponent for $d < 2$ and demonstrate that the anomalous dimension is universal and is due to a renormalization of the initial particle density. Our results are compared to the simulation data.

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