

Abstract Submitted
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The Trapping Reaction with Mobile and Reacting Traps BENJAMIN VOLLMAYR-LEE, ROBERT RHOADES, Bucknell University — We study the trapping reaction $A + B \rightarrow B$ in the case where both species of particle are mobile, and the traps themselves are annihilating $B + B \rightarrow 0$ or coagulating $B + B \rightarrow B$. We allow for a mixed trap reaction, with probability p of annihilation and $1 - p$ of coagulation, for the general case of unequal diffusion constants and variable trapping rate. We develop a computational technique that enables determination of the full probability distribution of the A particles for a particular realization of the B particles, which provides highly accurate measures for the A particle density and correlations. The A particle density is found to exhibit power law decay in all cases with a nontrivial decay exponent, and the A particle correlations exhibit scaling with an anomalous dimension. Our results are compared with various exact solutions, Schmoluchowski theory, and renormalization group predictions in applicable limits.

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