

# Trapping Reactions: Consequences of Subdiffusion

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Reactions that occur in constrained media (e.g., quasi-one dimensional, disordered, gelatinous) are of great renewed interest because of their ubiquitous occurrence in transport through cell membranes, ion channel gating and tumor growth, porous media, granular materials, electronic transport in nanocrystals, and many other applications. Many of these involve subdiffusive species, an area in which there are surprisingly few theoretical results. While there have been excellent theoretical advances in the description of the motion of subdiffusive particles, the description of the dynamics of reactions in such circumstances is far less clear. The problem is exacerbated when the motion of different species is characterized by different anomalous diffusion exponents.

In this talk we focus on a classic problem in the diffusion/random walk context but with new features in the subdiffusive arena: the reaction dynamics of (sub)diffusive particles surrounded by a sea of (sub)diffusive traps in one dimension. We find rigorous results for the asymptotic survival probability of the particle in most (but not all) cases.