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# The Hitting Times with Taboo for a Random Walk on an Integer Lattice

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For a symmetric, homogeneous and irreducible random walk on d-dimensional integer lattice Z^d, having zero mean and a finite variance of jumps, we study the passage times (with possible infinite values) determined by the starting point x, the hitting state y and the taboo state z. We find the probability that these passages times are finite and analyze the tails of their cumulative distribution functions. In particular, it turns out that for the random walk on Z^d, except for a simple (nearest neighbor) random walk on Z, the order of the tail decrease is specified by dimension d only. In contrast, for a simple random walk on Z, the asymptotic properties of hitting times with taboo essentially depend on the mutual location of the points x, y and z. These problems originated in our recent study of branching random walk on Z^d with a single source of branching.

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