LARGE DEVIATIONS FOR THE MAXIMUM OF A BRANCHING RANDOM WALK

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We consider real-valued branching random walks and prove a large deviation result for the position of the rightmost particle. The position of the rightmost particle is the maximum of a dependent collection of a random number of random walks. We characterise the rate function as the solution of a variational problem. We consider the same random number of independent random walks, and show that the maximum of the branching random walk is dominated by the maximum of the independent random walks. For the maximum of independent random walks, we derive a large deviation principle as well. It turns out that the rate functions for upper large deviations coincide, but the rate functions for lower large deviations do not.

Based on joint work with Thomas Höfelsauer.