

**Biggins, J. D.; Lubachevsky, Boris D.; Schwartz, Adam; Weiss, Alan**

**A branching random walk with a barrier.** (English) Zbl 0749.60076

*Ann. Appl. Probab.* 1, No. 4, 573-581 (1991).

A supercritical branching random walk with independent displacements having negative mean is equipped with a left-hand barrier which annihilates individuals which would otherwise pass through it. A simple criterion is obtained for the population to die out with probability one. Under this condition the expected total population size is found to grow asymptotically exponentially, with a determinable rate, as the barrier recedes. The motivation for this study is an interesting application to rollback-based simulation of systems with a large number of components.

Reviewer: [D.R.Grey \(Sheffield\)](#)

**MSC:**

[60J80](#) Branching processes (Galton-Watson, birth-and-death, etc.)

[60G50](#) Sums of independent random variables; random walks

[60F10](#) Large deviations

Cited in **1** Review  
Cited in **13** Documents

**Keywords:**

supercritical branching random walk; systems with a large number of components

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