

ONE DIMENSIONAL BROWNIAN MOTION WITH HOLDING AND JUMPING BOUNDARY

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Abstract

Let a particle start at some point in the unit interval $I := [0, 1]$ and undergo Brownian motion in I until it hits one of the end points. At this instant the particle stays put for a finite holding time with an exponential distribution and then jumps back to a point inside I with a probability density μ_0 or μ_1 parametrized by the boundary point it was from. The process starts afresh. The same evolution repeats independently each time. Many probabilistic aspects of this diffusion process are investigated in the paper [10]. The authors in the cited paper call this process diffusion with holding and jumping (DHJ). Our simple aim in this paper is to analyze the eigenvalues of a nonlocal boundary problem arising from this process.

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figures/WenboDHJ/WenboDHJ-eps-converted-to.pdf