



On Antagonistic Game With a Constant Initial Condition. Marginal Functionals and Probability Distributions

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Abstract: This paper continues dealing with a class of antagonistic games with two players initiated in Dshalalow et al. [1]. Here we validate our claim of analytic tractability in the results obtained in [1] under various transforms.

Keywords: *noncooperative stochastic games; fluctuation theory; marked point processes; Poisson process; ruin time; exit time; first passage time; modified Bessel functions.*

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1 Introduction

In this paper we continue our studies of a stochastic game of two players of a fully antagonistic nature initiated in [1] by the same authors. The game evolves as a mutual conflict involving two players A and B hitting each other at random and continued until one of the players is “exhausted.” In short, the players attack each other in accordance with two independent marked point processes

$$\mathcal{A} := \sum_{j \geq 1} w_j \varepsilon_{s_j}, \text{ and } \mathcal{B} := \sum_{k \geq 1} z_k \varepsilon_{t_k}, s_1, t_1 > 0,$$

representing respective attacks to players A and B. Here ε_a is the Dirac point mass at point $a \in \mathbb{R}$, $\sum_{j \geq 1} \varepsilon_{s_j}$, and $\sum_{k \geq 1} \varepsilon_{t_k}$ are underlying point random measures of the times of attacks, while the marks w_j 's and z_k 's represent respective damages to players A and

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