



On Tractable Functionals in Antagonistic Games with a Constant Initial Condition

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Abstract: This paper continues modeling of an antagonistic game with two players initiated in Dshalalow and Ke [4] which dealt with a stochastic game with player A losing to player B. Theorem 1 in [4] gave an explicit functional of several key components of the game, including the ruin time of A and the total casualties to both players at the exit, i.e. at A's ruin time. The claim of why the formula in Theorem 1 of [4] for the above mentioned functional was explicit is fully justified. Here we work on a particular case calculating Laplace-Carson inverse transforms and probability density functions followed by numerics.

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

Mathematics Subject Classification (2010): 82B41, 60G51, 60G55, 60G57, 91A10, 91A05, 91A60, 60K05.

1 Introduction

This paper models an antagonistic game with two players earlier initiated in Dshalalow and Ke [4]. The first part of [4] dealt with a basic game when player A lost the game to player B. Theorem 1 in [4] gave an explicit functional of several major components of the game, including the ruin (exit) time, the total casualties to both players at the exit. The claim of why the formula in Theorem 1 of [4] for the above mentioned functional was explicit is finally justified in this paper. Here we analyze a particular case evaluating Laplace-Carson inverse transforms and probability density functions followed by numerical calculations.

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