The Shepp–Shiryaev stochastic game driven by a spectrally negative Lévy process

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Abstract. We consider the stochastic game version of the Russian option (which we call the Shepp–Shiryaev stochastic game) driven by a spectrally negative Lévy process. We appeal to a mixture of techniques including fluctuation theory, stochastic analytic methods associated with martingale characterisations and reduction of the stochastic game to an optimal stopping problem to show existence of a solution. We derive the optimal stopping times as well as an expression for the value function of this stochastic game.

Keywords Stochastic game, spectrally negative Lévy process, scale functions, fluctuation theory.