

The relaxed optimal control problem of forward-backward stochastic doubly systems with Poisson jumps and its application to LQ problem

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Abstract

We study relaxed stochastic control problems where the state equation is a forward backward doubly stochastic differential equation with Poisson jumps, where the set of strict (classical) controls need not be convex and the diffusion coefficient and the generator coefficient depends on the terms control. In this paper, we introduce a new approach to solve this open problem, the main result is necessary conditions as well as a sufficient for optimality in the form of a relaxed maximum principle, with application to linear quadratic stochastic control problem with random jumps.

Keywords : Jump diffusion; stochastic maximum principle; strict control; relaxed control; adjoint equation; variational inequality; linear quadratic problem

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