A RELAXATION THEOREM FOR PARTIALLY OBSERVED STOCHASTIC CONTROL ON HILBERT SPACE

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Abstract

In this paper, we present a result on relaxability of partially observed control problems for infinite dimensional stochastic systems in a Hilbert space. This is motivated by the fact that measure valued controls, also known as relaxed controls, are difficult to construct practically and so one must inquire if it is possible to approximate the solutions corresponding to measure valued controls by those corresponding to ordinary controls. Our main result is the relaxation theorem which states that the set of solutions corresponding to ordinary controls is weakly dense in the set of solutions corresponding to relaxed controls. This is presented in Theorem 5.3 after giving some existence results on optimal controls for the infinite dimensional Zakai equation used for its proof.

Keywords: partially observed control, infinite dimensional Hilbert space, relaxed controls, Zakai equation.

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References


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