STABILITY AND INSTABILITY FOR SWITCHING JUMP-DIFFUSION PROCESSES

Fubao XI *Beijing Institute of Technology, China*, E-mail: xifb@bit.edu.cn

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Abstract: In this talk, we present some almost sure stability criteria for switching jump-diffusion processes with state-dependent switching. By means of introducing certain auxiliary Markov chains and constructing certain order-preserving couplings, upper and lower "stability envelops" are constructed, which lead to systems with "upper and lower" approximating Markov chains. Using these approximations, sufficient conditions that are relatively easily verifiable for the almost sure stability and instability are obtained. When the jump process is missing, it is demonstrated that the techniques work equally well and provide a way to analyze the corresponding switching diffusion systems with x-dependent switching. In addition, stochastic stabilization and destabilization are examined. Moreover, illustrative examples are provided for demonstration.