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12. Probability and Statistics

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Limit theorems and stability of Markov impulse systems

A Markov impulse system is a dynamical system with dependent on a step Markov process discontinuities of phase trajectories. Assuming both vector flow and quantities of phase jumps are proportional to small parameter ε the asymptotical methods for stability analysis are proposed. As the first step using the limit theorems in the Skorokhod space the limit stochastic differential equation or the limit ordinary differntial equation with switched by the enlarged Markov process right part are being constructed. It is proven that if $|\varepsilon|$ is sufficiently small, both the averaged equation and the diffusion approximation can be successfully used for stability analysis of initial impulse dynamical system.