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Well-posedness and stability for stochastic delay equations: A generalized coupling approach

Abstract

We study stochastic functional differential equations with past-dependent Hölder-continuous coefficients driven by Brownian motion. We show that these equations have a unique weak solution. Then we provide conditions under which the corresponding Markov process with values in a function space has an invariant probability measure which is weakly asymptotically stable. Our main tool to treat both weak uniqueness and asymptotic stability is the construction of suitable generalized couplings. This is joint work with Oleg Butkovsky and Alexey Kulik.