ID de Contribution: **7**   Type: **Non spécifié**

Approximation of reflected SDEs in non-smooth time-dependent domains and application to fully nonlinear PDEs with Neumann boundary condition on time-dependent domains

mardi 11 juin 2024 16:50 (30 minutes)

We consider a class of reflected stochastic differential equations in non-smooth time-dependent domains with time sections that are increasing with time. We provide a strong approximation for this type of equations using a sequence of a standard type. As a consequence, we obtain an approximation scheme for the associated generalized backward stochastic differential equations in this markovian setting using standard backward stochastic differential equations. As a by-product, we get an approximation by a sequence of standard partial differential equations for the solution of a system of partial differential equations with nonlinear boundary conditions on time-dependent domains.

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