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MEAN-FIELD OPTIMAL CONTROL PROBLEM OF SDDES DRIVEN BY FRACTIONAL BROWNIAN MOTION

BY

SOUKAINA DOUISSI (MARRAKECH), NACIRA AGRAM (OSLO), AND ASTRID HILBERT (VÄXJÖ)

Abstract. We consider a mean-field optimal control problem for stochastic differential equations with delay driven by fractional Brownian motion with Hurst parameter greater than $1/2$. Stochastic optimal control problems driven by fractional Brownian motion cannot be studied using classical methods, because the fractional Brownian motion is neither a Markov process nor a semi-martingale. However, using the fractional white noise calculus combined with some special tools related to differentiation for functions of measures, we establish necessary and sufficient stochastic maximum principles. To illustrate our study, we consider two applications: we solve a problem of optimal consumption from a cash flow with delay and a linear-quadratic (LQ) problem with delay.

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