

Pathwise stochastic control problems

NEERAJ BHAURYAL^a, ANA BELA CRUZEIRO^b, CARLOS OLIVEIRA^c

^a Grupo de Física Matemática
E-mail: nsbhauryal@fc.ul.pt

^b Grupo de Física Matemática & Dep. Matemática Instituto Superior Técnico
E-mail: ana.cruzeiro@tecnico.ulisboa.pt

^c Norwegian University of Science & Technology Faculty of Economics and Management
E-mail: carlos.m.d.s.oliveira@ntnu.no

Sobre o orador: Ana Bela Cruzeiro works in Stochastic Analysis and related topics in Mathematical Physics, Partial Differential Equations, Stochastic Geometric Mechanics.

Full professor at Instituto Superior Técnico, Department of Mathematics, she did her undergraduate studies in the Faculty of Sciences of the University of Lisbon, obtained her PhD (Doctorat d'État) in Mathematics by Université Pierre et Marie Curie and the title of Agregado in Mathematics in Faculty of Sciences of the University of Lisbon.

She is President of the Group of Mathematical Physics, Instituto Superior Técnico, correspondent member of the Academy of Sciences of Lisbon, member of the General Council of the University of Lisbon. She was until recently member of the Scientific Council of Instituto Superior Técnico, also member of the Scientific Council for Exact Sciences and Engineering of FCT (2017-2023) and President of the Portuguese Mathematical Society (2000-2004), among other positions.

Sumário

We consider stochastic optimal control problems in the pathwise sense, as initially proposed by Lions and Souganidis. The corresponding Hamilton-Jacobi-Bellman (HJB) equation, which turns out to be a non-adapted stochastic partial differential equation, is analyzed. Making use of the viscosity solutions framework, we show that the value function of the optimal control problem is the unique solution of the HJB.

Bibliografia

- [1] N. Bhauryal, A.B. Cruzeiro, C. Oliveira: *Pathwise Stochastic Control and a Class of Stochastic Partial Differential Equations*. Journal of Optimization Theory and Applications, **to appear**
- [2] P.-L Lions, P. E. Souganidis: *Fully nonlinear stochastic partial differential equations: non-smooth equations and applications*. Comptes Rendus de l'Académie des Sciences-Series I-Mathematics, **327(8), 735–741 (1998)**