

## **Optimal control for two-dimensional stochastic second grade fluids**

**Fernanda Cipriano**

Faculdade de Ciências e Tecnologia, UNL, Portugal

`cipriano@fct.unl.pt`

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This talk deals with a stochastic control problem for certain fluids of non-Newtonian type. More precisely, the state equation is given by the two-dimensional stochastic second grade fluids perturbed by a multiplicative white noise. The control acts through an external stochastic force and we search for a control that minimizes a cost functional. We show that the Gateaux derivative of the control to state map is a stochastic process being the unique solution of the stochastic linearized state equation. The well-posedness of the corresponding stochastic backward adjoint equation is also established, allowing to derive the first order optimality condition.