

Chaire d'excellence

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COURS

ENTROPY METHODS

Résumé

An overview over recently developed methods for proving decay to equilibrium for dissipative dynamical systems is presented. The methodology is based on Lyapunov functionals, often with the physical interpretation of a (generalized) entropy or free energy. The course features a short formal introduction to stochastic processes, aimed at an audience with a PDE background. The concepts of martingales and time reversal of homogeneous Markov processes are used to derive local decay results for relative entropies. These are applied to various examples of Levy processes, including applications in kinetic transport theory, in mathematical biology, and in chemical reaction networks. Quantitative decay results are derived from entropy decay inequalities or from inequalities between entropy decay and its time derivative, i.e. by the celebrated Bakry-Emery approach.

A focus is on hypocoercive problems, where decay to equilibrium holds despite the fact that the decay term for the natural entropy functionals is only semi-definite. Various recent approaches to such problems, mainly in kinetic theory, are compared and unified. Finally, examples of nonlinear problems are discussed, and the question of structural assumptions allowing for entropy decay is examined.

LUNDI 8 OCTOBRE 2018

LUNDI 15 OCTOBRE 2018

LUNDI 22 OCTOBRE 2018

LUNDI 29 OCTOBRE 2018*

LUNDI 5 NOVEMBRE 2018

LUNDI 12 NOVEMBRE 2018

MERCREDI 21 NOVEMBRE 2018

LUNDI 26 NOVEMBRE 2018

DE 14H À 17H

Institut Henri Poincaré - Salle 314

***et exceptionnellement salle 201 le 29/10/18**

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Information

www.sciencesmaths-paris.fr