

SHORT AND LONG TIME BEHAVIOUR OF HYPOCOERCIVE-TYPE MARKOV SEMIGROUPS

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ABSTRACT. We present a completely analytic method, alternative to Malliavin calculus, to study smoothing properties and long time behaviour of (the derivatives, of any order of) degenerate Markov semigroups.

We will consider in particular the case in which the generator of the semigroup is a differential operator of hypoelliptic/hypo coercive type. This kind of operators are of interest in non-equilibrium statistical mechanics, in the context of the heat bath formalism.

As an application/motivation for introducing this new technique we will look at systems of infinitely many interacting diffusions. The method we introduce is a combination of the classic Bakry-Emery approach together with the hypocoercivity theory recently introduced by C. Villani.