

Unique exponential ergodicity for SPDEs: general framework and applications

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I will present a general result that yields a verifiable set of assumptions under which a given Markov semigroup is a contraction in a suitable Wasserstein distance. As a consequence, this guarantees uniqueness of the invariant measure and exponential convergence towards it. In specific, our result is applicable to systems possessing an exponential Lyapunov structure, within which class it provides a generalization of the weak Harris theorem by Hairer, Mattingly, and Scheutzow (2011). I will also present applications of our general result for various stochastic models of fluid flow, including the 2D Navier-Stokes equations on a bounded domain, the 2D hydrostatic Navier-Stokes equations, a damped nonlinear wave equation, and the Rayleigh-Benard system. This is based on joint works with Nathan Glatt-Holtz (Indiana U.) and Juliane Dalben (Drexel U.).

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