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On the rate of estimation for the stationary distribution of stochastic differential equations with and without jumps.

In this talk, we will discuss some results on the estimation of the invariant density associated to a multivariate diffusion $X = (X_t)_{t\geq 0}$, solution of a stochastic differential equation with or without jumps.
The estimation of the invariant density is a problem of great relevance because of the huge amount of applications in physics and numerical methods, the Markov Chain Monte Carlo above all. Evidence of the attractiveness of the non-parametric estimation for the stationary measure of a continuous mixing process is the fact such a subject is both a long-standing problem and a living topic.
We propose kernel density estimators, based on the continuous record of the trajectory $X^T = (X_t)_{0\leq t\leq T}$, and we measure their accuracy by studying the size of their pointwise L^2 error. We first of all find the convergence rates associated to the proposed estimators. After that, we wonder if it possible to propose other estimators which achieve better convergence rates.