

Abstract: "Convergence and regularity of probability laws by using
an interpolation method"

Fournier and Printems [Bernoulli, 2010] have recently established a methodology which allows to prove the absolute continuity of the law of the solution of some stochastic equations with Hölder continuous coefficients. This is of course out of reach by using already classical probabilistic methods based on Malliavin calculus. By employing some Besov space techniques, Debussche and Romito [Probab. Theory Related Fields, 2014] have substantially improved the result of Fournier and Printems. In our paper we show that this kind of problem naturally fits in the framework of interpolation spaces: we prove an interpolation inequality which allows to state (and even to slightly improve) the above absolute continuity result. Moreover it turns out that the above interpolation inequality has applications in a completely different framework: we use it in order to estimate the error in total variance distance in some convergence theorems.