

$$S_t \circ c(h)(a_s)_{ti} c(s) + \mathfrak{S}_e m^i n(a_r)$$

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# On the regularity properties of conditional densities for partially observable uniformly nondegenerate diffusion processes with Lipschitz coefficients.

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We present several results on smoothness in  $L_p$  sense of filtering densities under the Lipschitz continuity assumption on the coefficients of a partially observable diffusion processes. We obtain them by rewriting in divergence form filtering equation which are usually considered in terms of formally adjoint to operators in nondivergence form. In this talk, we consider a class of random-forced nonlinear heat equations. We present criteria for existence and uniqueness of solutions. More importantly, we investigate the long-time behavior of the solutions using upper Liapounov exponents. This talk is based on joint work with Davar Khoshnevisan.