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Parabolic Anderson model driven by colored noise

The aim of this talk is to present some recent result on the stochastic heat equation on $\mathbb{R}^d$

$$\frac{\partial u}{\partial t} = \frac{1}{2}\Delta u + \sqrt{\lambda} u \dot{W},$$

with initial condition u_0, where $\lambda > 0$ and the noise $\dot{W}(t,x)$ is white in time and it has an homogeneous spacial covariance. In the one-dimensional case, we allow the covariance of the noise to be rougher than the classical space-time white noise, including the case of a fractional noise with Hurst parameter $H \in (1/4, 1/2)$. On the other hand, the initial condition can be a measure that integrates the function $e^{-a|x|^2}$ for all $a > 0$. We show the existence of a unique mild solution using its Wiener chaos expansion and we derive Feynman-Kac formulas for the moments. We compute the Liapounov exponents and discuss intermittency properties of the solution.