# High-frequency analysis for parabolic stochastic PDEs

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We consider the stochastic heat equation driven by an additive or multiplicative Gaussian noise that is white in time and spatially homogeneous in space. Assuming that the spatial correlation function is given by a Riesz kernel of order $\alpha \in (0, 2 \wedge d)$, where $d$ is the spatial dimension, we prove a central limit theorem for the power variations of the solution in the additive case. We further show that the same central limit theorem is valid with multiplicative noise if $\alpha \in (0, 1)$ but fails in general if $\alpha = 1$ (and $d \geq 2$) or if the noise is a space-time white noise (and $d = 1$). If time permits, we discuss applications of our results to statistical estimation for the stochastic heat equation.