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Random conductance models with stable-like jumps

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Abstract

We study the quenched invariance principle and two-sided heat kernel estimates for random conductance models with long range jumps on $\mathbb{Z}^d$, where the transition probability from x to y is in average comparable to $|x-y|^{-(d+\alpha)}$ with $\alpha \in (0,2)$ and the associated conductances are not uniformly elliptic. Under some moment conditions on the conductance, we prove that the scaling limit of the Markov process is a symmetric α-stable Lévy process on $\mathbb{R}^d$. We also prove that (elliptic) Harnack inequalities do not hold in the present setting. Our results could be applied to general discrete metric measure space. The talk is based on a joint paper with Takashi Kumagai and Jian Wang