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**Heat kernel estimates and Harnack inequalities for some Dirichlet forms with non-local part.** (English) [Zbl 1190.60069](#)

*Electron. J. Probab.* 14, 314-340 (2009).

Summary: We consider the Dirichlet form given by

$$\mathcal{E}(f, f) = \frac{1}{2} \int_{\mathbb{R}^d} \sum_{i,j=1}^d a_{ij}(x) \frac{\partial f(x)}{\partial x_i} \frac{\partial f(x)}{\partial x_j} dx + \int_{\mathbb{R}^d \times \mathbb{R}^d} (f(y) - f(x))^2 J(x, y) dx dy.$$

Under the assumption that the  $a_{ij}$  are symmetric and uniformly elliptic and with suitable conditions on  $J$ , the nonlocal part, we obtain upper and lower bounds on the heat kernel of the Dirichlet form. We also prove a Harnack inequality and a regularity theorem for functions that are harmonic with respect to  $\mathcal{E}$ .

**MSC:**

[60J35](#) Transition functions, generators and resolvents  
[60J25](#) Continuous-time Markov processes on general state spaces  
[60J75](#) Jump processes (MSC2010)

Cited in **13** Documents

**Keywords:**

[integro-differential operators](#); [Harnack inequality](#); [heat kernel](#); [Hölder continuity](#)

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