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Fundamental solution of fractional diffusion equation with singular drift

I will discuss a joint work with Grzegorz Karch and Jacek Zienkiewicz. I will consider the fractional Laplacian $\Delta^{\alpha/2}$, where $\alpha \geq 1$, with divergence free drift satisfying estimates $|b(x)| \leq C|x|^{1-\alpha}$. I will show that the fundamental solution $P(t, x, y)$ of this operator has global in time estimates $P(t, x, y) \leq ct^{-d/\alpha} \wedge t|x - y|^{-d-\alpha}$. Generally I will focus rather on the method than on the results.

References

- [1] T. Jakubowski, G. Karch, J. Zienkiewicz, *Fundamental solution of fractional diffusion equation with singular drift*, preprint
- [1] T. Jakubowski, *Fractional Laplacian with singular drift*, Stud. Math. 207, No. 3, 257-273 (2011)