FRACTIONAL LAPLACIAN WITH SINGULAR DRIFT

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For $\alpha \in (1,2)$ we consider the equation $\partial_t u = \Delta^{\alpha/2} u - b \cdot \nabla u$, where b is a time-independent, divergence free singular vector field belonging to the Morrey space $M_1^{1-\alpha}$. We show that if $||b||_{M_1^{1-\alpha}}$ is sufficiently small the fundamental solution is globally in time comparable with the density of the isotropic stable process. The talk is based on the papers [1], [2].

REFERENCES

[1] K. Bogdan, T. Jakubowski, *Estimates of heat kernel of fractional Laplacian perturbed by gradient operators*, Comm. Math. Phys. 271, No. 1, 179–198 (2007).
[2] T. Jakubowski, *Fractional Laplacian with singular drift*, Stud. Math. 207, No. 3, 257–273 (2011).