NONLOCAL POROUS MEDIUM EQUATION

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We study a generalization of the porous medium equation $\partial_t u = \nabla \cdot \big(|u|\nabla p\big)$ with the nonlocal and nonlinear pressure $p = (-\Delta)^{\frac{\alpha}{2}-1}(u|u|^{m-2})$ and we show the existence of solutions to the corresponding initial value problem. Moreover, we construct explicit compactly supported self-similar solutions using the Getoor function expressing the expectation of the first passage time to the exterior of the unit ball of the symmetric α-stable process.

This is a joint work with Piotr Biler and Cyril Imbert.

References

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