Ultracontractivity for p-fractional Robin-Venttsel' problems in extension domains

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In this talk we consider a Robin-Venttsel' problem for the regional fractional p-Laplace operator on an extension domain Ω; such domains can have a highly irregular boundary, for example of fractal type.
We first consider the parabolic problem and, by using nonlinear semigroup theory, we prove that it admits a unique weak solution. We then prove that the nonlinear semigroup associated to this problem is ultracontractive; this is achieved by means of a fractional logarithmic Sobolev inequality, adapted to the problem at hand.
We also consider the elliptic problem and we prove that it admits a unique bounded weak solution.
These results are obtained in collaboration with M. R. Lancia.