

1112-35-93

**Luis Silvestre\***, luis@math.uchicago.edu, and **Tianling Jin**. *Gradient Holder continuity for the parabolic homogeneous  $p$ -Laplacian equation.*

It is well known that  $p$ -harmonic functions are  $C^{1,\alpha}$  regular, for some  $\alpha > 0$ . The classical proofs of this fact use variational methods. In a recent work, Peres and Sheffield construct  $p$ -Harmonic functions from the value of a stochastic game. This construction also leads to a parabolic versions of the problem. However, the parabolic equation derived from the stochastic game is not the classical parabolic  $p$ -Laplace equation, but a homogeneous of degree one version. This equation is not in divergence form and variational methods are inapplicable. We prove that solutions to this equation are also  $C^{1,\alpha}$  regular in space. (Received July 22, 2015)