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**M. T. Barlow\***, Dept. of Math., University of British Columbia, Vancouver, BC V6T 1Z2, Canada, and **R. F. Bass** and **T. Kumagai**. *Parabolic Harnack Inequality for jump processes on fractal spaces*. Preliminary report.

While diffusions on fractal sets have been studied for about 20 years, work on jump processes on fractals (or  $d$ -sets) began much more recently. In many ways this theory is easier than that for diffusions, and in particular it requires much less regularity in the space.

This talk will survey the area, and look at conditions for the following to hold for a symmetric jump process  $X$  on a regular  $d$ -set:

1. Transition density upper and lower bounds.
2. The solutions of the heat equation satisfy a parabolic Harnack inequality with scaling parameter  $\alpha$ .
3. An elliptic Harnack inequality holds, and one has good control of the exit time from balls.

For diffusions the analogous conditions are all equivalent – see [GT, BBK]. For jump processes the situation is more complicated.

### References

[BBK] M.T. Barlow, R.F. Bass, T. Kumagai. Stability of parabolic Harnack inequalities on metric measure spaces. To appear *J. Math. Soc. Japan*.

[GT] A. Grigor'yan, A. Telcs. Harnack inequalities and sub-Gaussian estimates for random walks. *Math. Annalen* **324** (2002), 521–556. (Received February 16, 2006)