Title: On the topological boundary of the range of super-Brownian motion

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Abstract: Let $\partial\mathcal{R}$ be the topological boundary of the range of super-Brownian motion and dim denotes Hausdorff dimension, then with probability one, for any open set U, $U \cap \partial\mathcal{R} \neq \emptyset$ implies

$$\dim(U \cap \partial\mathcal{R}) = d_f := \begin{cases} 4 - 2\sqrt{2} \approx 1.17 & \text{if } d = 2, \\ \frac{9-\sqrt{17}}{2} \approx 2.44 & \text{if } d = 3. \end{cases}$$

These dimension estimates are also refined in a number of ways. In $d = 2$ and $d = 3$, we construct a random measure $\mathcal{L}$, called the boundary local time measure, whose support equals $\partial\mathcal{R}$. It is constructed as a rescaled limit of the total local time L_∞^x where mass becomes concentrated at points x where L_∞^x is small but positive. It is conjectured that the d_f-dimensional Minkowski content of $\partial\mathcal{R}$ is equal to the total mass of the boundary local time $\mathcal{L}$ up to some constant.