1116-60-1587 **Joe P. Chen*** (joe.p.chen@uconn.edu), Department of Mathematics, University of Connecticut, Storrs, CT 06269, and **Alexander Teplyaev** (teplyaev@math.uconn.edu), Department of Mathematics, University of Connecticut, Storrs, CT 06269. *Current large deviations in the boundary-driven symmetric simple exclusion process on the Sierpinski gasket.*

We study the symmetric simple exclusion process on the Sierpinski gasket (SG) driven by the action of particle reservoirs attached to boundary vertices of SG.

We establish three hydrodynamic limit theorems for the empirical current: the law of large numbers, the large deviations principle, and the large deviations principle for the mean current on a long-time interval. On $\mathbb{Z}^d$ these results were established assuming translational invariance and Gaussian space-time diffusive estimates. But on SG neither assumption is valid, and it is unclear how to make sense of the resulting reaction-diffusion PDE.

In this work we overcome all the aforementioned obstacles. First, we prove the "moving particle lemma" on weighted graphs using the "octopus inequality" of Caputo, Liggett, and Richthammer in their seminal proof of Aldous' spectral gap conjecture. This enables us to prove a local version of the two-blocks estimate on SG, thereby answering a question posed by Jara. Second, we actively use the theory of differential 1-forms on SG developed by the second author and collaborators, which allows us to characterize the speed of convergence of discrete 1-forms on SG, and prove uniqueness of solutions to the resulting reaction-diffusion PDE. (Received September 20, 2015)