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Scaling limit of the exclusion process on resistance spaces

I will describe recent results and challenges on implementing the hydrodynamic program to obtain scaling limits of the weakly asymmetric exclusion process on low-dimensional spaces, namely, those which are bounded with respect to the resistance metric, which include trees, fractals, and random graphs. The key functional tool is an energy inequality for the exclusion process on a finite weighted graph, which leads to a coarse-graining (local ergodic) lemma that enables the passage from the microscopic model to the macroscopic (nonlinear) heat equation.

This is based on joint works with M. Hinz and A. Teplyaev, cf. arXiv:1606.01577, 1702.03376, 1705.10290, and forthcoming papers.