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Annealed scaling relations for Voronoi percolation. (English) Zbl 1467.60082

Summary: We prove annealed scaling relations for planar Voronoi percolation. To our knowledge, this is the first result of this kind for a continuum percolation model. We are mostly inspired by the proof of scaling relations for Bernoulli percolation by H. Kesten [Commun. Math. Phys. 109, 109–156 (1987; Zbl 0616.60099)]. Along the way, we show an annealed quasi-multiplicativity property by relying on the quenched box-crossing property proved by D. Ahlberg et al. [Adv. Math. 286, 889–911 (2016; Zbl 1335.60178)]. Intermediate results also include the study of quenched and annealed notions of pivotal events and the extension of the quenched box-crossing property of [Zbl 1335.60178] to the near-critical regime.

MSC:
60K35 Interacting random processes; statistical mechanics type models; percolation theory
60K37 Processes in random environments

Keywords:
percolation; scaling relation; Voronoi tiling; near-criticality; random environment; quasi-multiplicativity

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