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Simple random covering, disconnection, late and favorite points. (English) Zbl 1099.60028

Sanz-Solé, Marta (ed.) et al., Proceedings of the international congress of mathematicians (ICM), Madrid, Spain, August 22–30, 2006. Volume III: Invited lectures. Zürich: European Mathematical Society (EMS) (ISBN 978-3-03719-022-7/hbk). 535-558 (2006).

Summary: We review recent advances in the study of the fractal nature of certain random sets, the key to which is a multi-scale truncated second moment method. We focus on some of the fine properties of the sample path of the most basic stochastic processes such as the simple random walk and the Brownian motion. As we shall see, probability on trees inspires many of our proofs, with trees used to model the relevant correlation structure. Along the way we also mention a few open problems.

For the entire collection see [Zbl 1095.00006].

MSC:

60G17	Sample path properties
28A80	Fractals
60J65	Brownian motion
82C41	Dynamics of random walks, random surfaces, lattice animals, etc. in time-dependent statistical mechanics
60G50	Sums of independent random variables; random walks

Keywords:

Random walk; Brownian motion; Gaussian free field; cover time; late points; thick points; multi-fractal analysis; intersection local time