Mathematics > Probability

Semi-infinite paths of the 2d-Radial Spanning Tree

François Baccelli (INRIA Rocquencourt), David Coupier (LPP), Viet Chi Tran (LPP, CMAP)

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We study semi-infinite paths of the radial spanning tree (RST) of a Poisson point process in the plane. We first show that the expectation of the number of intersection points between semi-infinite paths and the sphere with radius r grows sublinearly with r. Then, we prove that in each (deterministic) direction, there exists with probability one a unique semi-infinite path, framed by an infinite number of other semi-infinite paths of close asymptotic directions. The set of (random) directions in which there are more than one semi-infinite paths is dense in $[0,2\pi)$. It corresponds to possible asymptotic directions of competition interfaces. We show that the RST can be decomposed in at most five infinite subtrees directly connected to the root. The interfaces separating these subtrees are studied and simulations are provided.

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