THE COVER TIME OF THE GIANT COMPONENT OF THE RANDOM GEOMETRIC GRAPH WITH FIXED RADIUS

CARLOS MARTINEZ

Abstract. The cover time of a graph could be understood as the average time that it takes a random walker to visit all the vertices of the graph. In the Random Geometric Graph (RGG), the vertices appear from a Poisson Point Process of intensity 1 in the square $[-n/2, n/2]^d$, and the edges from connecting all the vertices that are at a distance at most r_n. It is known that there exists a connected giant component whp when $r_n > r_c$, where r_c is a critical constant. For $d > 1$, we prove that the cover time of the giant component of the RGG is of order $nlog^2(n)$ whp when $r_n = r$ is constant and $r > r_c$. The proof is based on the construction of logarithmic paths with "bad" connection and a grid-like structure of the giant component.

IMCA