Some results for range of random walk on graphs with spectral dimension two

Kazuki Okamura, *Kyoto University*

We will consider the range of random walk on graphs with spectral dimension two. We will state that a certain weak law of large numbers holds for recurrent graphs satisfying a homogeneity condition. We will state that the behavior of appropriately scaled expectations is stable with respect to any "finite modification" of the two-dimensional integer lattice. We will construct a recurrent graph such that the uniform condition holds but appropriately scaled expectations fluctuate. As a result, the law of large numbers mentioned above is best in a sense. Our result is applicable to showing LILs for lamplighter random walks in the case that the spectral dimension of the underlying graph is two.