Random walks on long-range percolation clusters: Gaussian heat kernel estimates and estimates on the effective resistance

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We consider the problem of the random walks on the long-range percolation clusters in a vertex set of Euclidean lattice. In one-dimensional case, under a certain condition that the effects of long bonds are relatively small, we obtain Gaussian on-diagonal heat kernel estimates. We also give several estimates on volumes and effective resistances associated with the model. This is partly a joint work with Professor T. Kumagai.