

Dynamical process on growing geometrical network based on modular group

ABSTRACT

Many network models have been proposed and constructed to mimic the underlying features of complex networks. Studying the dynamical process of a network gives a good platform to understand how the underlying geometrical and structural features influence various transport properties. In this study, the dynamical process on the network is described by using random walks. From this process, some of the random walk transport properties are determined such as relaxation time, mean first passage time (MFPT), random walk centrality (RWC), average trapping time (ATT) and global mean first passage time (GMFPT). We find that GMFPT grows exponentially when the network grows. This is mainly due to some central nodes that have high RWC, which tends to attract the random walker more compared to a node with a lower RWC. This study plays an important role in determining the performance of the network.

Keyword: Complex networks; Mean first passage time; Random walk; Random walk centrality

