Analysis of Guangzhou metro network based on L-space and P-space using complex network
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Abstract: Recently, most of studies about characteristic analysis of transport network are based on L-space, a common topology for building complex network in transport studies. In this paper, two different topology types (including L-space and P-space) were introduced to build the networks for Guangzhou metro. Some important parameters of complex network were calculated, such as, degree, degree distribution, clustering coefficient and average distance of network. And the key stations, average shortest distance, average shortest time-spent, average transfer times, average pass-by line and the clustering coefficient were obtained for analyzing the characteristic of Guangzhou metro. In the station network based on L-space, the average degree of the whole network is 2.092. Only a few stations have high degree, such as, Tiyuxilu, Gongyuanqian and Zhujian New Town. They become the key stations of Guangzhou metro. The average shortest distance, the average pass-by stations and the average shortest time-spent between any stations is 21.08km, 13.44 and 27.38min separately. In the transfer network based on the P-space, the average degree of the whole network is 40. Among the stations, Guangzhou railway station has the largest degree of 92, and it can reach 46 other station directly. Experiments showed that the average shortest distance of the network is 2.35, that is, it need transfer 1 or 2 times (take 2 or 3 different trains) to reach the other station.