

Abstract

Nowadays, data traffic demand grows rapidly. Meanwhile frequency resources is limited, coexistence network where LTE femtocell share radio frequency with existing GSM is suggested. Some problems need to be investigated in the coexistence network i.e, the problem about mutual impact between GSM macro and LTE femto on each performances and how their performances system change due to various deployment condition. In the previous study also does not provide a clear and comprehensive solution. Thus, more metrics need to be defined and compared in different scenarios.

Major concern of this study are to design frequency allocation between GSM network and LTE femto. As well, to investigate the mutual impacts between GSM network and LTE femto on each performances. In this study, we focus on the uplink GSM system. We simulate some scenarios in the coexistence network, i.e heterogeneous macrocell size, heterogeneous reuse factor, dynamic femtocell number and dynamic femtocell position.

The performance of both systems is analyzed mathematically in terms of SINR and femtocell throughput. Simulation is employed to support analysis, the result shows that the increasing femtocell number will decrease system performance. In the mean time, femtocell position farther toward GSM BS will decrease SINR GSM and increase SINR LTE femtocell and throughput. In relation to the impact of macrocell size, the bigger macrocell size which set off the impairment of SINR GSM, the more increasing of SINR LTE femtocell and

femtocell throughput. Generally, it can be seen that network with smaller reuse factor provide an advance performance rather than bigger reuse factor.

Keywords:

Frequency allocation, GSM, Integrated with, LTE femto.