Automatic Adaptive Frequency Planning for GSM Basestation

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ABSTRACT

The radio wave propagation characteristics have a great impact on the communications between the base station and mobile stations. Reflection, diffraction, and scattering are three basic propagation mechanisms which affect the received signal strength. In order to provide a better received signal quality, the telecommunication companies must make suitable base station plans which include the broadcast frequency selection, the station altitude and the distance between any two base stations. However, the coverage of a base station is based on the traffic load. When the traffic load is high, the coverage of the base station will decrease. This will result in the increase of the number of base stations. After the cellular system operates for a long time, the geography of the system will totally different with the theoretical topology because the increase of base stations. As a consequence, the service quality will degrade. How to maintain the service quality becomes an important issue for the telecommunication company. A good frequency selection plan for each base station can improve the service quality. However, most of the existing frequency selection plans involve the human resource, which results in an additional working effort. For this reason, this thesis proposes an automatic adaptive frequency plan which combines the exclusion method and the interference sorted method to provide a quick and easy way to select a suitable frequency for each base station. We implement this plan with the Visual Basic. After verifying with the existing GSM systems, we find the proposed plan can select the better frequency for each base station and might largely promote the telecommunication company's working efficiency in the GSM frequency planning improvement work.

Keywords : Removes Other Method, Interference Quantity Method, Adaptive, Frequency Plan Design, Weighting Scoring Law.

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