

## ABSTRACT

In the first and second generation mobile networks speech has been the dominating service. In emerging 3G technologies, like the WCDMA FDD system, new types of services are enabled by the higher data rates supported. The bandwidth, quality of service, and indoor capacity demand is increasing in existing and future cellular networks.

In this final project we analyzed and simulated the using of indoor pico base station to improve system performance. A network scenario consists a macro cell network with 7 Base Stations and an indoor hotspot location in the building with indoor pico base station. For outdoor propagation model, that from the macro base station to outdoor user, COST 231 Walfish Ikegami is used. For indoor propagation model, Multi Wall Model is used. The path loss between an outdoor macro base and an indoor mobile is calculated in two steps. The first step is to calculate the outdoor loss, as described in previous section, at each side of the building. The second step is to calculate the indoor loss. Distributed Constrained Power Control (DCPC) algorithm is using for updating the power levels.

We showed how performance can be improved, both in the hotspot itself and in the surrounding macro cell network, by using pico base stations. When indoor user served by macro base station, the performance is only 10%, but when indoor user served by pico base station the performance increase until 92 % satisfied user.

**Keywords: WCDMA FDD, hotspot, performance**

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