S72-238 WCDMA systems

Tutorial 4 8.01.2002.

Exercises

1.

In WCDMA system are 10 users at the distances to BS $1, 2, 3, ..., 10\ \ km$ accordingly. Data rate to each user is 30 $\frac{kbit}{s}$ and the spread bandwidth is 3.84 $\frac{Mchip}{s}$. The target SIR for all users is 10 dB.

Is the system in interference (capacity) or noise limited?

a) In uplink when maximum transmitted power of one user is $0.1\ \ W$.
b) In downlink when total transmitted power of the BS is $10\ \ W$.
c) What would be transmitted power for each user if they were in the network alone and minimal transmission power is $-50\ \ dB$.

Attenuation in the channel is 3, 4,and Okomura-Hata. (Height of the BS is $h_{bs} = 50\,m$).

2.

For the same parameters as in exercise 1 what is the situation in uplink and downlink when to consider other cell interference factor to be 0.65.

3.

Calculate the noise rise for different load factors. When the system has chip rate $3.84\ \frac{Mchip}{s}$, target user $SIR = 5\ \ dB$, user data rate $30\ \frac{kbit}{s}$, orthogonality factor in downlink $\alpha = 0.4$.

Calculate the following noise rises:

a) Uplink.
b) Uplink with other cell to own cell interference $i = 0.65$.
c) Downlink.
d) Downlink with $i = 0.65$.