

S72-238 WCDMA systems

Tutorial 5

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Exercises

1.

Erlang capacity of the system.

In the system are 4 cells in each cell are 237 users. Each user generates load 25 *mErlangs*.

- What is the blocking probability in one cell when in the cell are available 8 channels?
- What is the blocking probability when the cells are combined and served by one big cell with 4×8 channels?
- What is average call arrival time in one cell? What will be average arrival time in the big cell? The average call duration is 100 *s*.

2.

How many users can one cell serve when WCDMA system contains a mix of different type of users:

- 5 % high speed users with data rate $8 \frac{kbit}{s}$ and requiring *SIR* target 7 *dB*
- Three data users with data rate $64 \frac{kbit}{s}$ users with target *SIR* requirement 5 *dB*.
- Rest of the users are slow moving speech users ($8 \frac{kbit}{s}$) requiring *SIR* target 5 *dB*.

The neighbouring cell interference factor $i = 0.5$.

3.

Calculate the soft capacity of the system with parameters.

Bit rates	Speech	15 $\frac{kbit}{s}$
	Real time data	15 $\frac{kbit}{s}$
		64 $\frac{kbit}{s}$
Voice activity	Speech	65 %
	Data	100 %
Eb/No	Speech	4 <i>dB</i>
	Data 15	3 <i>dB</i>
	Data 64	2 <i>dB</i>
i		0.65
Noise rise		3 <i>dB</i>
Blocking probability		2 %
Spread chiprate		3.84 $\frac{Mchip}{s}$