Dynamic System Level Simulator for W-CDMA with Smart Antennas

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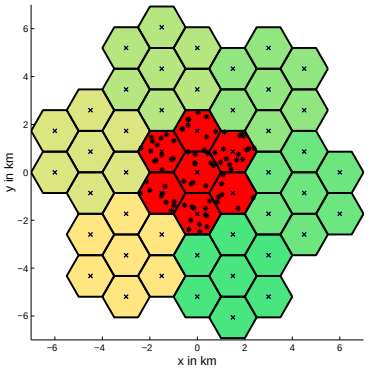
Cellular systems

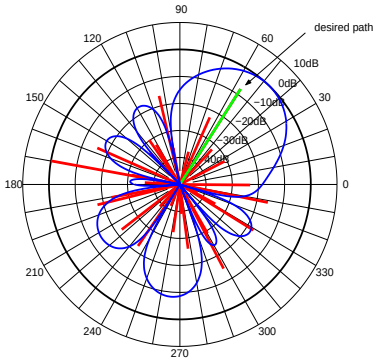
The fundamental problem of any cellular mobile communication system is interference caused by unwanted users.

Interference appears in uplink and downlink transmission. It can be taken into account correctly only if a whole cellular system is analyzed which considers intra- as well as inter-cell interference.

The number of mobile stations that can be supported with a certain quality of service gives the performance of the system.

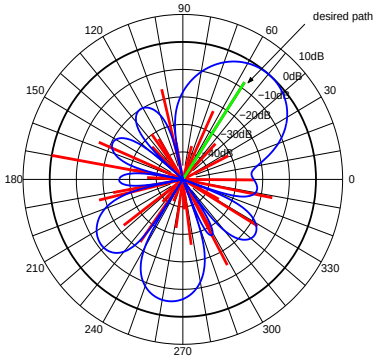


Uplink beamforming



Uplink beamforming is based upon spatial channel covariance matrices estimated in uplink direction.

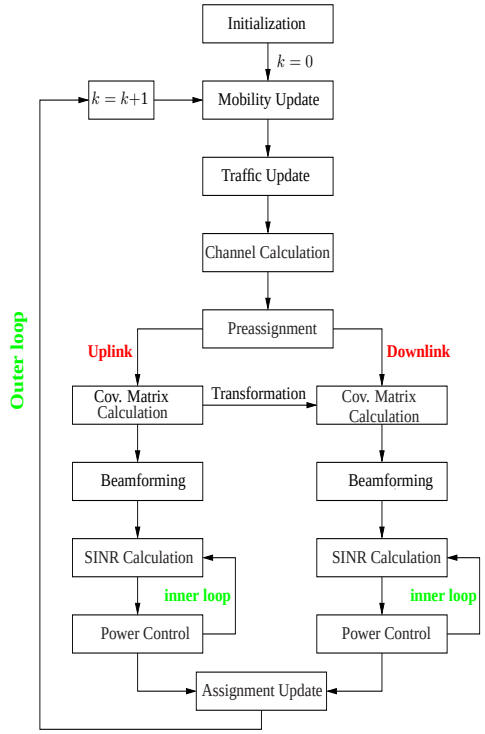
Downlink beamforming



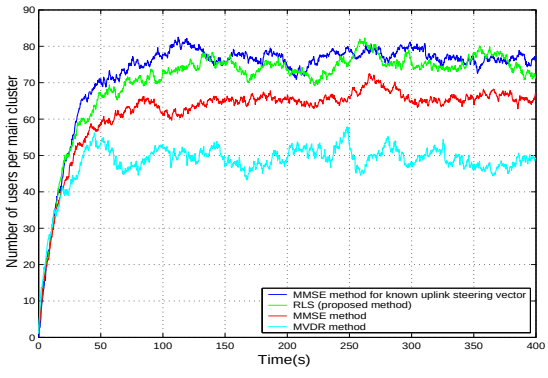
Downlink beamforming is carried out by transforming the uplink covariance matrix into downlink frequency.

It can be observed that antenna patterns vary similar to the uplink can be obtained.

Simulation approach



Performance comparison



Robust transformation methods are necessary when there is uncertainty in uplink spatial signatures.

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