8.5.1 CDMA link level system mapping

Power control is a crucial mechanism in CDMA mobile radio networks, which needs to be modeled in SEAMCAT. It is a complex process involving various layers of signaling, measurement and modulation/demodulation procedures. It is not feasible to model signaling, link and chip level details of CDMA power control in network level simulations performed by SEAMCAT due to the complexity and CPU time constraints. Hence, it is necessary to adopt the two-step approach employed widely in the industry for the simulation of CDMA based systems.

The first step utilizes link level simulations that model fast fading channels, power control procedures and actual chip level algorithms to generate outputs that map channel power requirements to link quality (e.g. frame erasure rate, FER). Such simulations involve the knowledge of intricate details of the CDMA signaling procedures and modulation/demodulation methods.

Major CDMA vendors develop link level simulations and contribute their results to the standard bodies. Since the link level results are independent of most system level variations (cell sizes, amplifier ratings, antenna types, etc.), they are applicable to a wide variety of network configurations. The second step in the simulation of CDMA involves system level simulations that actually model the CDMA network on a macro scale. Since the required channel power vs. link performance data is available from the link level results, transmit power levels for CDMA channels can be calculated and utilized in the system level modelling of a CDMA network.

The approach described above enables the reuse of link level data to model various network configurations. Furthermore, through the use of the link level data, an accurate power control model is implicitly included in the system level simulations that run at moderate complexity.

The built-in CDMA Link level Data used in DL and UL can be found in Section 13.4.6. SEAMCAT allows you to load your own library too.

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