7.1 Introduction

Whereas traditional simulation of non-CDMA or non-OFDMA systems is carried out in SEAMCAT by taking two pairs of transmitters-receivers and estimating signals received between them separately (i.e. without any form of feed-back influence), the simulation of cellular systems requires a much more complex process of power controlling in a fully loaded system, including impact from two tiers of neighbouring cells and, for victim cellular systems, the attempt by the system to level-out the interference impact.

There are two different types of Monte-Carlo model that could be employed: a ‘static’ model, also referred to as a ‘snapshot’ model, and a ‘dynamic’ model. In a cellular network, connections will frequently arrive and leave the network during a given period of time. This causes fluctuating traffic and power levels. Principally, it is possible to carry out a dynamic Monte-Carlo taking into account this fluctuating traffic in real time. It can account for dynamical statistical characteristics; however it is extremely time consuming to run. In cases, where many scenarios need to be investigated, such long runtimes could become restrictive. Therefore, the snapshot model is preferred in such cases and selected for SEAMCAT. This model sets up a random distribution of users based on one instant in time in connection with a network configuration and considered service characteristics. A set of statistics which accurately reflects these scenarios is derived by simulating several such snapshots.

To investigate the coexistence of a mobile radio network with another radio technology in SEAMCAT, a snapshot of both victim and interfering systems is modeled at each event generation in SEAMCAT, which generates transmit power, interference levels as well as the probability of link success of the victim system for a given number of users at a time instant. It captures a snapshot of the UE powers in the network and the number of user links which can be successfully carried given these powers. In order to analyze the impact of the interfering network on the victim one, the success rates of the victim network in the presence and absence of the interfering system are compared.

The term UE or MS are used interchangeably in this manual. You should review and modify the input parameters of the cellular network for the particular scenario that is being simulated and more detailed can be found in publications such as [6], [7] or [8].

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