

1.1 Background to spectrum engineering

The radio spectrum is a limited resource and can only be used optimally if compatibility is assured between wireless systems located in the same or adjacent frequency bands. For example, an important criterion for radio compatibility is the difference between the wanted and unwanted signal levels in the victim link receiver input. This parameter can be used to derive a separation in physical position or frequency between the victim and interfering systems. Considering only the adjacent bands, the most significant interference mechanisms are unwanted emissions from interfering transmitters as well as blocking and intermodulation in the victim link receiver.

A statistical simulation model based on the Monte-Carlo method has been developed within the CEPT Working Group Spectrum Engineering, named SEAMCAT® (Spectrum Engineering Advanced Monte-Carlo Analysis Tool). This software implementation allows quick yet reliable considerations of spatial distributions of the received signals and the resulting statistical probability of interference in a wide variety of scenarios. By adapting the operational conditions of radio systems with respect to the probability of exceeding the protection criterion, the most efficient use of the radio spectrum can be identified

SEAMCAT is software that simulates radio spectrum systems, allowing the implementation of user customized libraries and the use of those provided by other users to ease the effort to build complete scenarios. These libraries may contain predefined antenna patterns, spectrum emission masks, propagation models, complete radio systems, etc.

SEAMCAT version 5 and upward provides multicore processing allowing for fast computations.

It is possible to join the SEAMCAT community to contribute to the development of the software and libraries, as explained in Section [1.8](#).



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