4.2 iRSSblocking

Intro

For this exercise, the blocking response from the receiver has a positive sign as shown in Figure 101. Detailed information on the calculation of the $iRSS_{blocking}$ can be found in section A5.2 of ANNEX 5:.

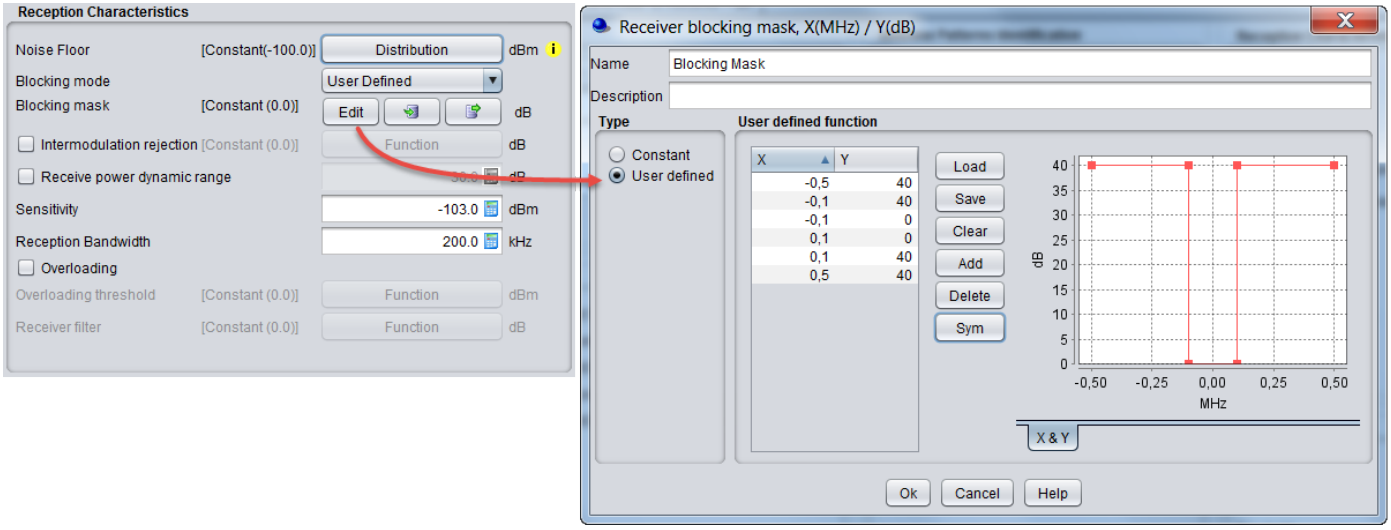

Figure 101: Definition of the receiver blocking response

4.2.1 User-defined mode

In this case, the Blocking is provided in dB and represents the attenuation of the receiver at a given frequency offset (see A8.7). The resulting receiver attenuation equals the user-defined input values. Then, the $iRSS_{blocking}$ *at the interferer operating frequency* may be calculated as follows.

(***Note:*** *The ILT bandwidth is not considered in the* $iRSS_{blocking}$ *calculation*):

(Eq. 22)

$$iRSSblocking(fit) = Pe + Ge + Gr - L - Att(fit)$$

$$iRSSblocking = 33(dBm) + 11 + 9 - (32.5 + 10log(32) + 20log(1000)) - 40(dB)$$

$$iRSSblocking = -94.5dBm$$

This can be checked by running a simulation and displaying the $iRSS_{blocking}$ in case of User-defined mode calculated by SEAMCAT. See the figure below.

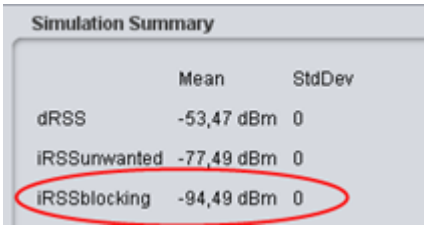

Figure 102: Mean $iRSS_{blocking}$ in case of User-defined mode

4.2.2 Sensitivity mode

In this calculation mode the function $block_{Max\ Interf\ Signal}(Df)$ that you entered represents the absolute power level (in dBm) of maximum interfering signal (maximum acceptable interfering power), which might be tolerated by the receiver at a given frequency separation (see A8.7).

In this case SEAMCAT calculates the receiver attenuation, Attenuation (*Df*), to be applied to the interfering signal by using the following expression:

$$\mathrm{Attenuation(Df)} = \mathrm{blockMaxInterfSignal(Df)(dBm)} - \mathrm{sensVLR(dBm)} + \mathrm{C/(N+I)(dB)} - \mathrm{I/N(dB)}$$

(Eq. 23)

where:

- D*f* = (f_{ILT} - f_{VLR}) is the frequency separation;
- $sens_{VLR}$ is the sensitivity of the VLR (dBm) as defined in the simulation scenario.

To achieve a realistic value, you may define the sensitivity ($sens_{VLR}$) as (see the figure below):

Sensitivity = Noise Floor + C/(N+I)

Sensitivity = -110 dBm + 16 = -94 dBm

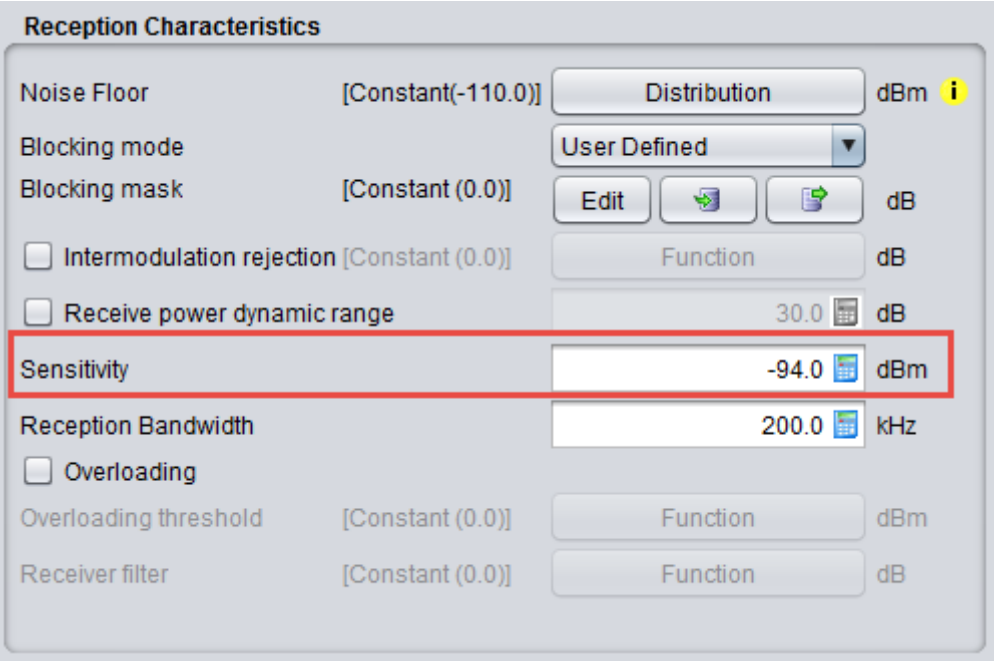

Figure 103: Setting up the sensitivity in SEAMCAT

Then the attenuation may be evaluated:

Attenuation (Df) = 40 + 94 + 16 - 0 = 150 dB

$iRSS_{blocking}$ *= Interfering Signal Level (f it)= -54.5 - 150 = -204.5 dBm*

This can be checked by running a simulation and displaying the $iRSS_{blocking}$ in case of Sensitivity mode calculated by SEAMCAT see Figure 104.

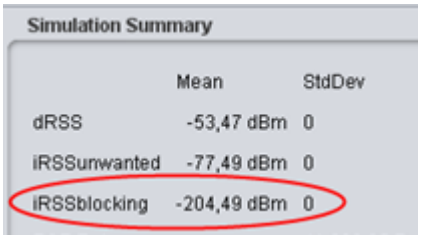

Figure 104: Mean $iRSS_{blocking}$ in case of Sensitivity mode

4.2.3 Protection ratio

This mode is identical to the “sensitivity” mode since the only difference is that the Blocking value (relative to the noise floor) is provided in dB. The software processes the information using exactly the same method to obtain the value of the receiver attenuation (see A8.7).

The function $block_{Protection\ Ratio}(Df)$ that you entered represents the protection ratio, i.e. the ratio of maximum acceptable level of interfering signal to the wanted signal level, at a given frequency separation.

In this case SEAMCAT calculates the receiver attenuation $a_{VLR}(Df)$ to be applied to the interfering signal by using the following expression (see Figure 105):

(Eq. 24)

$$Attenuation(\Box f) = blockProtectionRatio(\Box f)(dB) + C/(N+I)(dB) + (N+I)/N(dB) - I/N(dB)$$

$$Attenuation(\Box f) = 40 + 16 + 3 - 0 = 59dB$$

$$iRSSblocking = InterferingSignalLevel(fit) = -54.5 - 59 = -113.5dBm$$

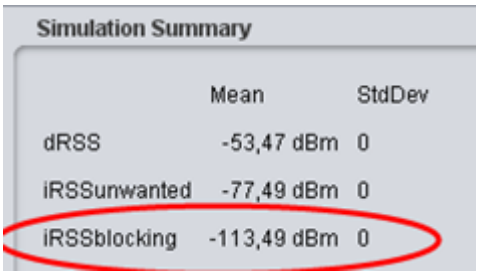

Figure 105: Mean $iRSS_{blocking}$ in case of Protection-ratio mode