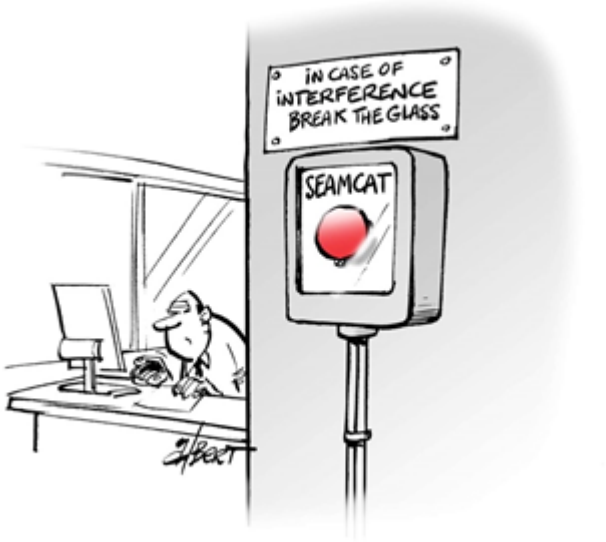
4.7.1 Uniform density mode - simulation radius calculation



The number of active transmitters that will be uniformly located within the simulation radius is given by:

$$n_{active} = dens_{transmitter} \cdot prob_{transmission} \cdot \pi \left(R_{simulation}\right)^2 \qquad \text{(Eq. 28)}$$

Figure 120 presents the GUI with the input value.

Settings in the System tab	Settings in the Scenario tab

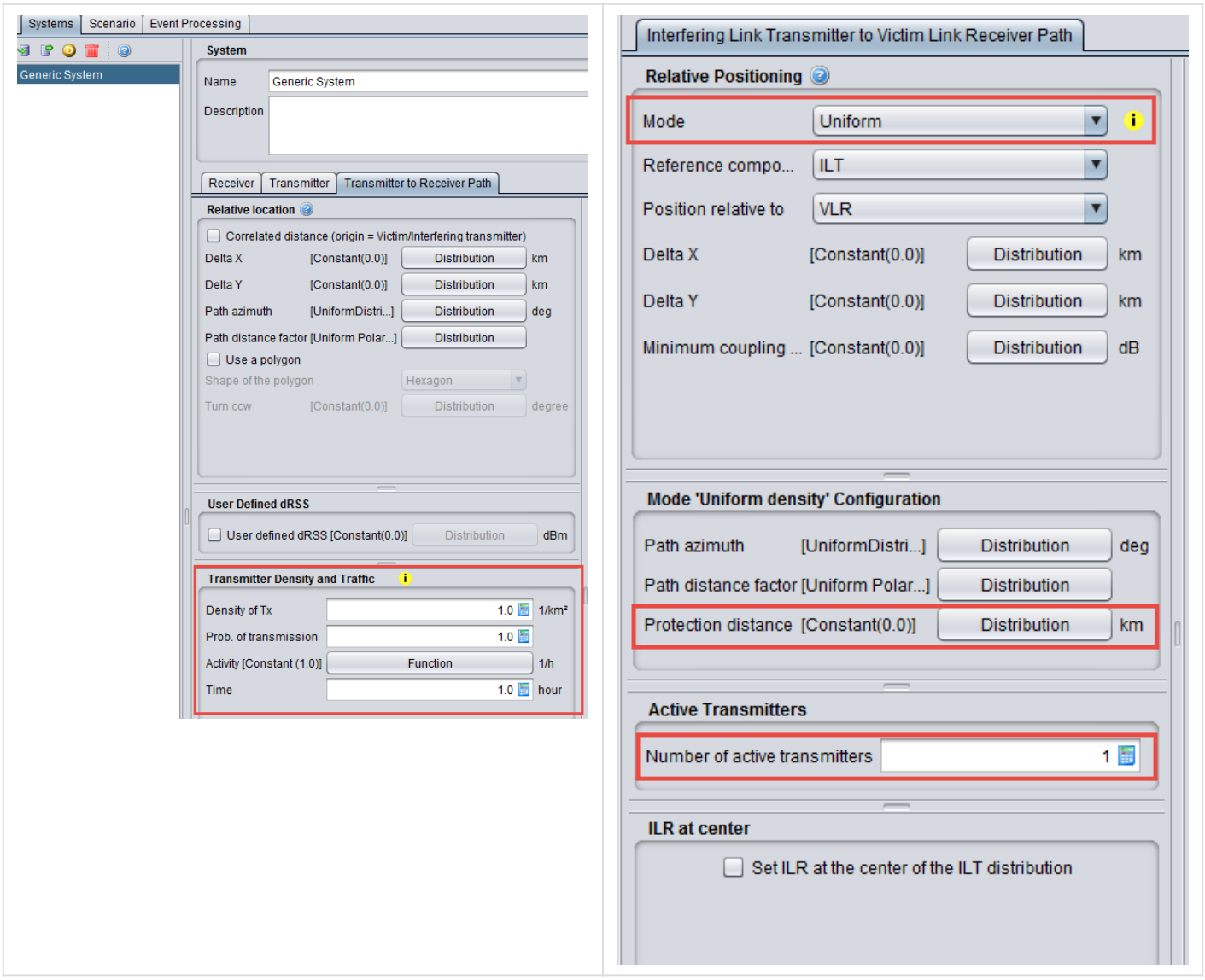


Figure 120: Setting up the simulation radius in SEAMCAT

(Note that the results of the simulation radius is displayed only after running simulation)

The simulation radius is calculated by using the following formula:

$$R_{simu} = \sqrt{\frac{n_{active}}{\pi \; dens_{it}^{active} . prob_{transmission}}} \qquad \text{(Eq. 29)}$$

In the example of Figure 120, this gives:

$$R_{simu} = \sqrt{\frac{1}{\pi \times 10 \times 1}}\$ = 0.178km$$

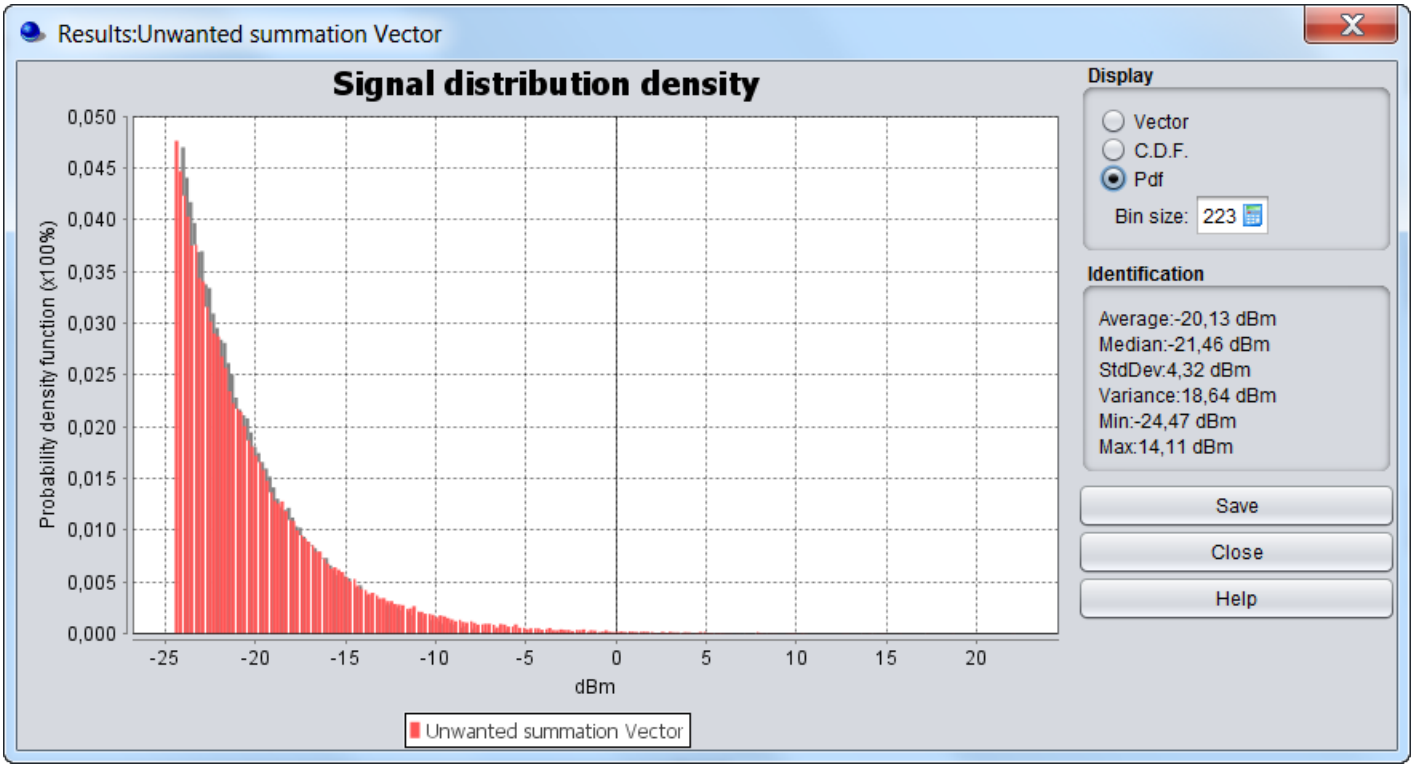


Figure 121: iRSS using the simulation radius for 1 active transmitter (R=0.178)

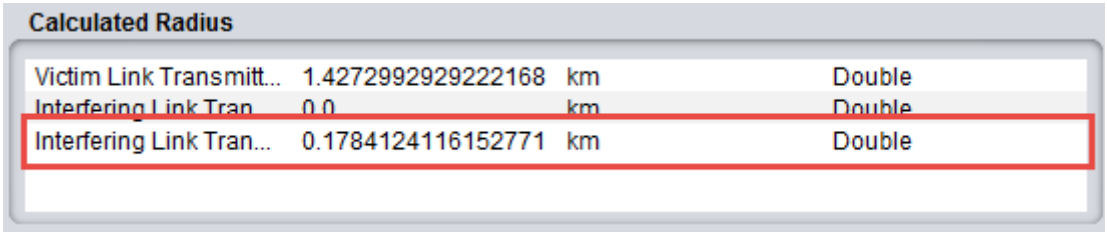


Figure 122: Calculated simulation radius with 1 active transmitter

Then for a ***single*** interefering link transmitter located at the edge of the simulation radius (R = 0.178 km), the $iRSS_{unwanted}$ may be calculated:

$$iRSSunwanted = 33(dBm) + 11 + 9 - (32.5 + 10log(0.178^2) + 20log(1000)) = -24.5dBm$$

When increasing the number of active transmitters to 10 (see Figure 123), the simulation radius becomes:

$$R_{simu} = \sqrt{\frac{10}{\pi \times 10 \times 1}}\$ = 0.564km$$

Then, for a ***single*** interefering link transmitter located at the edge of that simulation radius (R = 0.564 km), the $iRSS_{unwanted}$ resulting from this terminal may be calculated as:

$$iRSSunwanted = 33(dBm) + 11 + 9 - (32.5 + 10log(0.564^2) + 20log(1000)) = -34.5dBm$$

If 10 active terminals are located at the edge of the simulation radius, the $iRSS_{unwanted}$ may be calculated in the following way:

$$iRSSunwanted = -34.6(dBm) + 10log(10) = -24.5dBm$$

Then the $iRSS_{unwanted}$ should be above -24.5 dBm as shown on Figure 124.

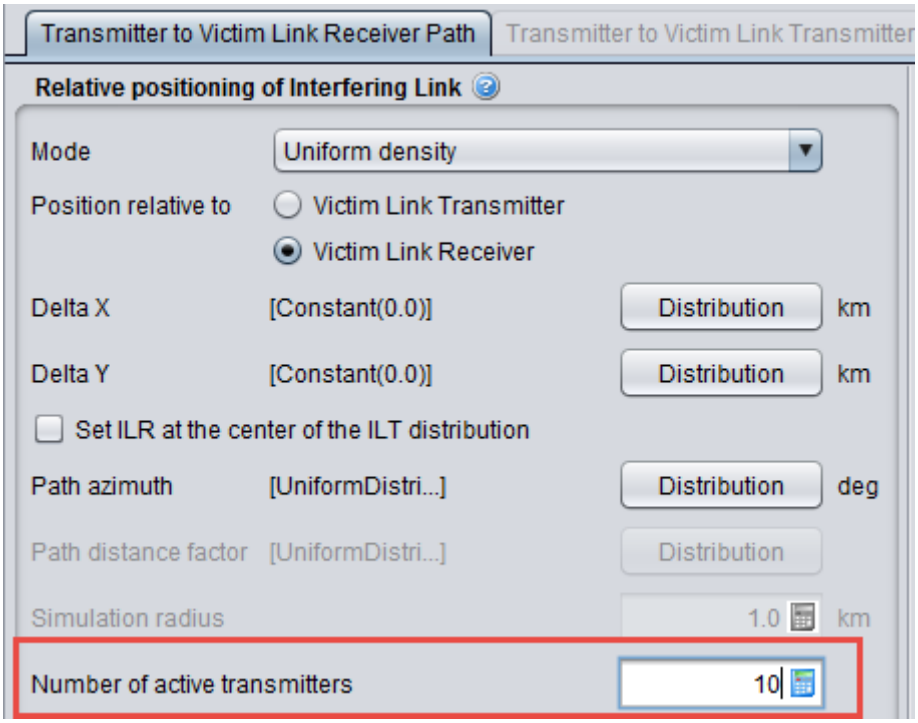


Figure 123: Setting up the simulation radius in SEAMCAT with a different number of active transmitters

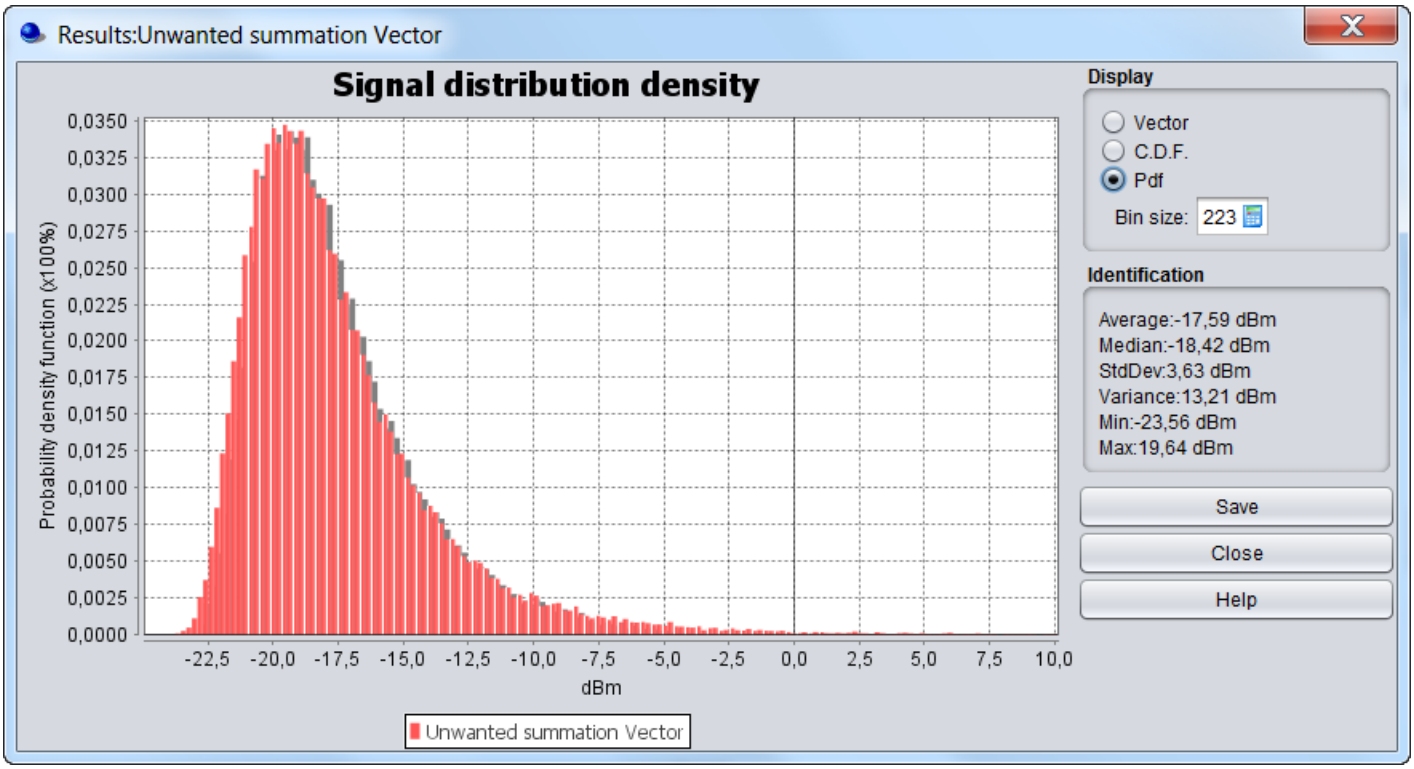


Figure 124: iRSS using the simulation radius calculated for 10 active interferers (R=0.564 km)

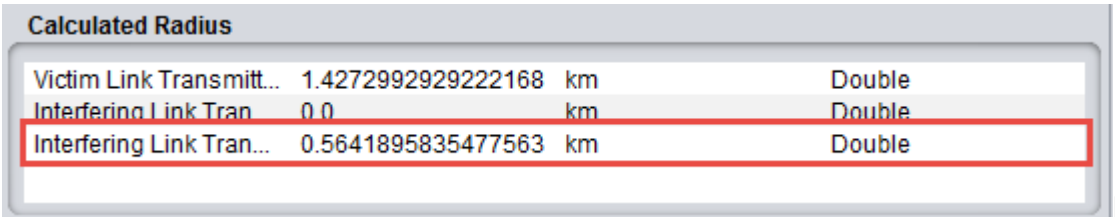


Figure 125: Calculated simulation radius with 10 active transmitters

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