

Noise Power Analysis

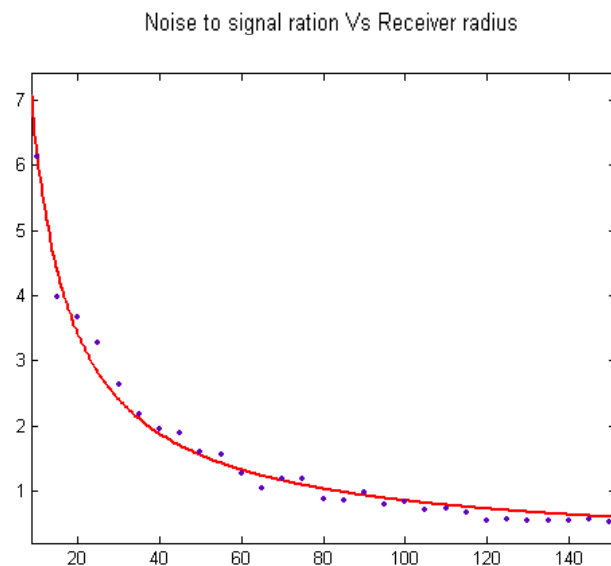
In order to validate inverse proportionality with respect to the receiver radius of the power noise, we made several simulations.

We used different sizes of receivers (from R=10, 15, 20... up to 150nm) measuring the particle concentration in the medium when there is no transmitter just a constant concentration.

The simulator model Brownian motion plus collision among particles.

The dimension space was 2500x2000nm, the Receiver location was 1000x1000 nm, time step 1ns, number of particles (R=0.2nm) suspended in the medium was 10000.

The noise power is a Noise to signal ratio. (It is measured as the maximum variation among different measures when constant concentration divided by the signal or average concentration.)



The blue points are the measurements according to the different dimensions of receivers and the red line is the curve fitting to $f(x) = a \cdot x^b$

The obtained Coefficients (with 95% confidence bounds) are:

$$a = 45.19 \quad (39.06, 51.31)$$

$$b = -0.8618 \quad (-0.9049, -0.8186)$$