
Class Homework 2 due in class Monday February 8
Almost the same as last week, but with noise.

Use the drawing below and expressions for the power density in watts/m$^2$ at the scatterer, the total power collected by the scatterer, the power radiated from the scatterer back toward the receiver, and receiver aperture to calculate the total power in watts at the input to the receiver. This is fundamental—use geometry and algebra. It is repetition, but worth the practice.

Obtain watts at the receiver input for transmitter power 2 mW, transmitter antenna gain 6 dB, path from transmitter to scatterer 4m, path from scatterer to receiver 4m, scatterer size 10 cm square, scatterer gain toward receiver 6 dB, frequency 2304 MHz. The receiver noise figure is 10 dB and the bandwidth 2 Hz. How many dB is the signal above the receiver noise floor?

Convert the received power in watts to dBm and volts in a 50 ohm system. If a receiver has a noise figure of 1 dB, what is the noise temperature in Kelvin?

Wednesday this week we will have informal progress reports on you individual blocks of the class project. This is more to identify problems than evaluate progress.