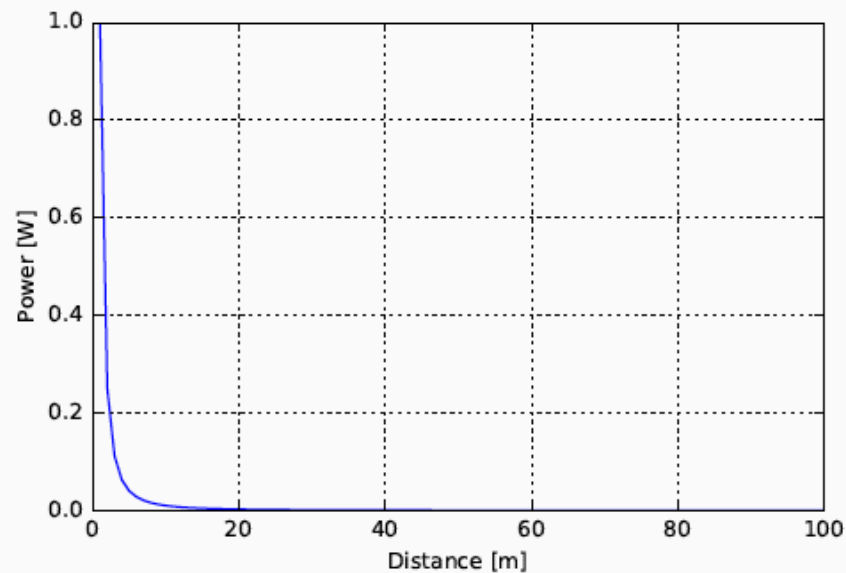# Propagation loss: ideal model
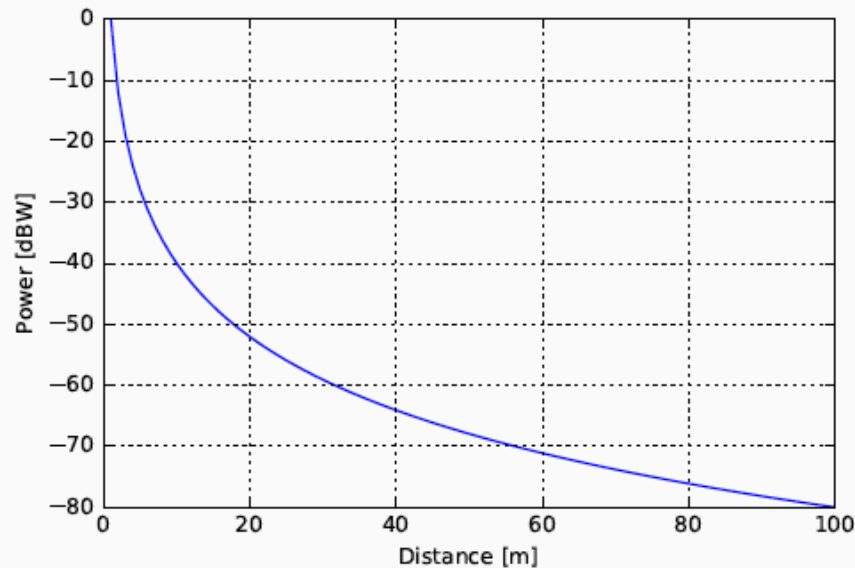
- The power P at the detector decays following an inverse square law with distance r i.e. $P \propto \frac{1}{r^2}$

Log scale: dB

- As signals can vary over many orders of magnitude, it is more convenient to represent them in a logarithmic notation
- By convention, we use decibels (dB), which are given by:

$$P(dB) = 10 \log 10(P)$$

Generalized model

- The path-loss coefficient γ is 2 under ideal, free-space conditions
- However, depending on the environment it can vary from 2 (ideal) to 5 (strong attenuation)
- Modified model: $P \propto \frac{1}{r^\gamma}$

Generalized model