

Special Problem IV.B-1

A communications link has the following parameters:

Transmit power = 100 W

Transmit antenna effective aperture (maximum) = 0.1 m^2

Receiver antenna effective aperture (maximum) = 0.2 m^2

The transmitter and receiver are separated by a distance of 10 km, and the antennas are pointed at each other.

Determine for $f = 10 \text{ GHz}$ and $f = 60 \text{ GHz}$ (assume effective aperture is same for both frequencies):

- 1) Receive power assuming propagation in free space.
- 2) Receive power assuming propagation in clear weather at sea level (see handout).