

Absorption of Millimeter Waves

Signal losses are associated with each stage of signal processing in both the transmitting and receiving portions of the system. The transmitting losses include power transmission efficiency, waveguide and antenna losses, and duplexer losses. In the receiver, losses include antenna, waveguide, RF amplifier, mixer, and IF amplifier.

In addition to these losses, energy traveling through the atmosphere suffers from atmospheric attenuation caused primarily by absorption by the gasses. For lower frequencies (below 10 GHz), the attenuation is reasonably predictable.

For high frequencies in the millimeter wave range, the attenuation not only increases, but becomes more dependent upon particular absorbing characteristics of H₂O, O₂, and the like.

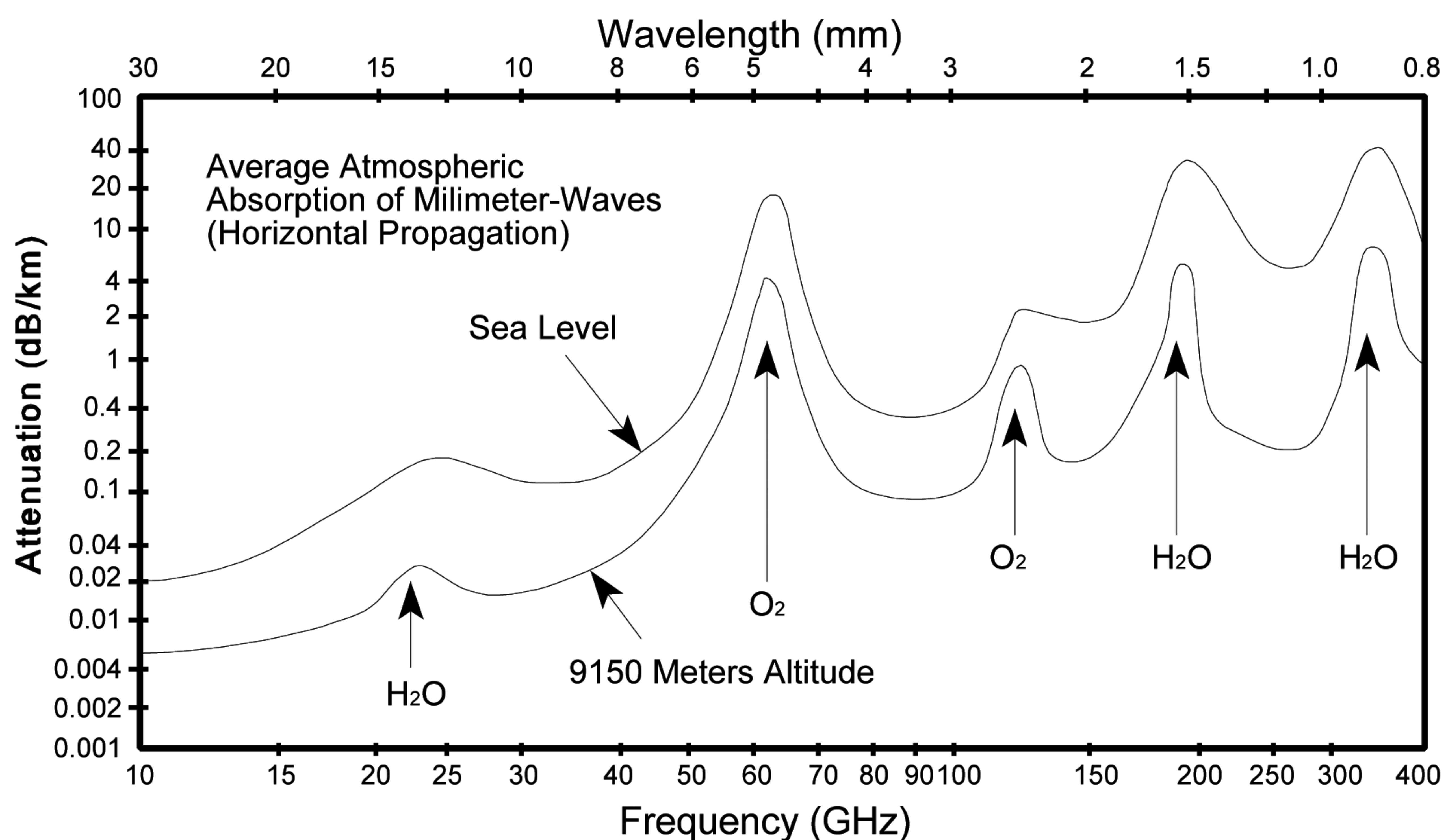


Figure 1. Atmospheric Absorption of Millimeter Waves