The isolation between two dipole antennas can be approximately computed by using the following equations (10a), (10b) and (10c):

$$HI(dB) \approx 22 + 20\ \log(x/\lambda) \quad (10a)$$

$$VI(dB) \approx 28 + 40\ \log(y/\lambda) \quad (10b)$$

$$SI(dB) \approx (VI - HI) \cdot 2\theta/\pi + HI \quad (10c)$$

where θ (rad) is $\tan^{-1}(y/x)$, x is the horizontal distance, and y is the vertical distance. The equations are applicable when x is greater than 10λ and y is greater than λ.

These isolations obtained from equations (10a), (10b) and (10c) can be substituted for the basic transmission loss ($L_b(d)$) of equation (1) or the propagation path loss (L_p) of equation (9) when two stations are co-located.

FIGURE 1

Antenna isolation in horizontal, vertical and slant direction