

Comparison of Mechanical vs. Electrical Beamtilt

Figure 1 shows the cross-section of a broadcast pattern with no beam tilt applied. For comparison purposes, the peak gain is assumed to be 1. The pattern extends in a "donut" shape parallel to the horizon.

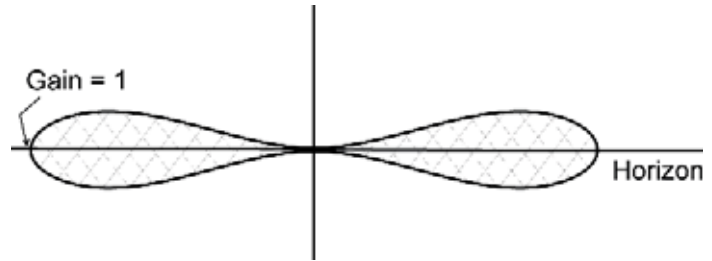


Figure 1. No Beamtilt

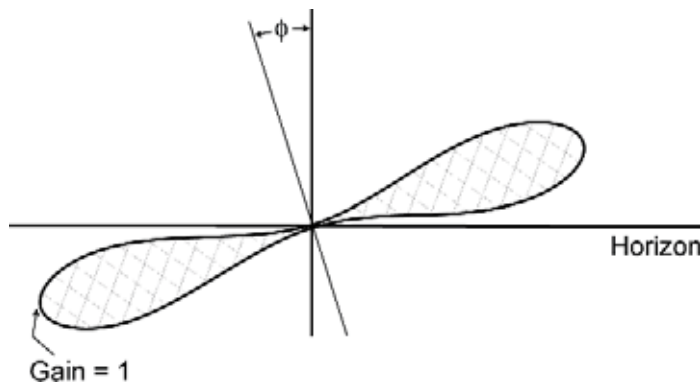


Figure 2. Mechanical Downtilt, Angle ϕ

Figure 2 shows the same antenna with ϕ beam downtilt applied. The peak gain remains at 1; but the same cross-sectional "donut" pattern is now tilted ϕ , with one edge tilted down, the opposite edge tilted up.

Figure 3 shows the same antenna with θ electrical downtilt applied. The peak gain has dropped to less than 1, but the cross-sectional pattern is now curved down in all directions, changing the "donut" shape to a cup or cone shape. Angle θ and peak gain depend on the design parameters.

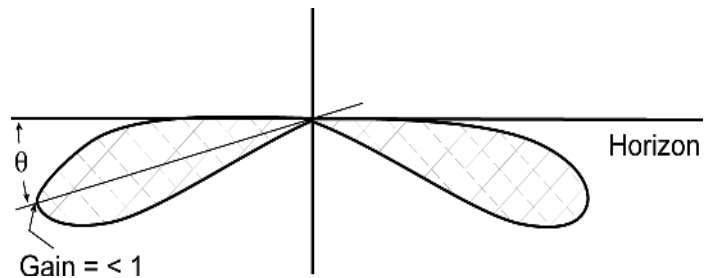


Figure 3. Electrical Downtilt, Angle θ

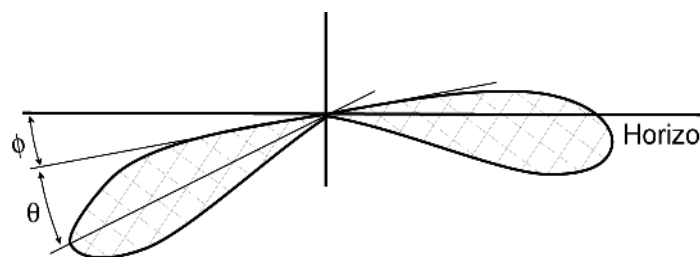


Figure 4. Mechanical Downtilt, Angle ϕ , Combined with Electrical Downtilt, Angle θ

Figure 4 shows the same antenna once again, this time with both ϕ of mechanical downtilt and θ of electrical downtilt. The cross-sectional cupped shape of figure 3 is now tilted as in figure 2.

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