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.

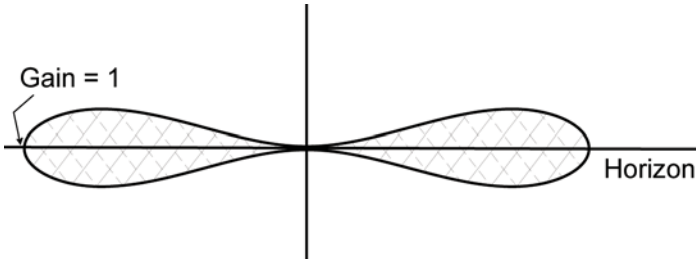

Figure 1. No Beamtilt

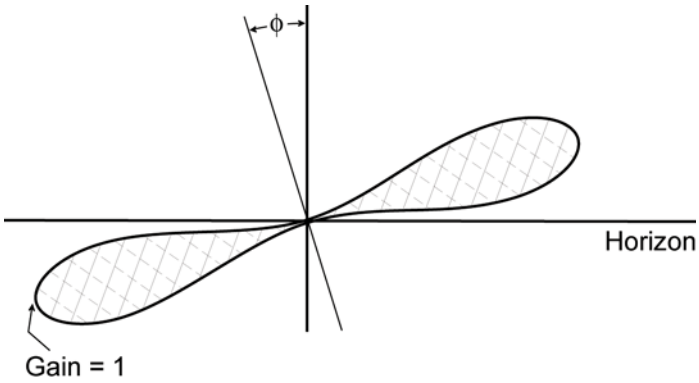

Figure 2. Mechanical Downtilt, Angle Θ°

Figure 2 shows the same antenna with Θ° beam downtilt applied. The peak gain remains at 1; but the same cross-sectional "donut" pattern is now tilted Θ°, 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.

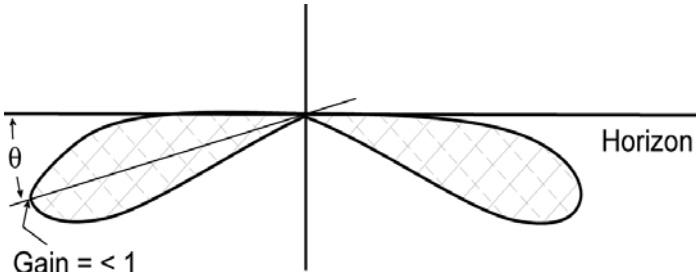

Figure 3. Electrical Downtilt, Angle Θ°

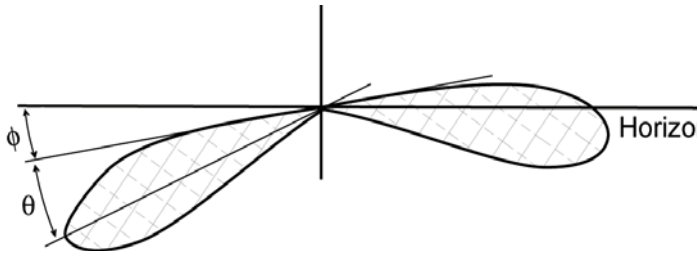

Figure 4. Mechanical Downtilt, Angle Φ°, Combined with Electrical Downtilt, Angle Θ°

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.

Document No. tb-beamtilt_comparison (150319)

A Division of Howell Laboratories, Inc., P. O. Box 389, Bridgton, Maine 04009 USA www.shively.com
(207) 647-3327 1-888-SHIVELY Fax: (207)647-8273 sales@shively.com
An Employee-Owned Company *Certified to ISO-9001*