λ/2 Dipole directivity pattern

Spherical coordinates

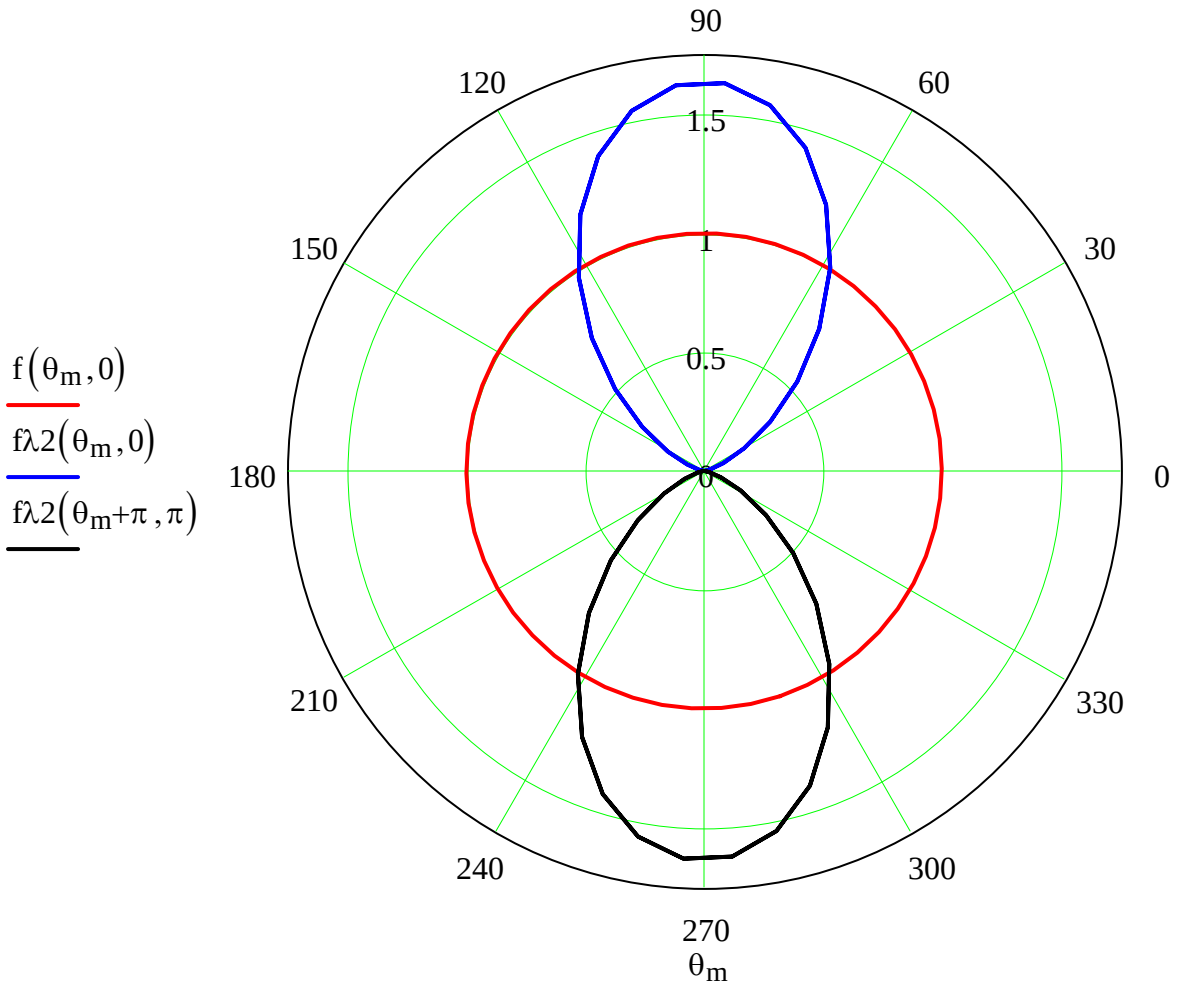
$N := 50 \qquad m := 0 .. N \qquad n := 0 .. N$

$\theta_m := \frac{2 \cdot \pi \cdot (m - 10)}{N} + 0.01 \qquad \phi_n := \frac{2 \cdot \pi \cdot n}{N}$

Directivity radiation patterns in spherical coordinates for isotropic and dipole antennas

$f(x, y) := 1 \qquad f\lambda 2(x, y) := 1.64 \cdot (\sin(x))^3$

2D directivity radiation patterns in *x-y* plane for isotropic and dipole antennas



λ/2 Dipole directivity radiation patterns cont.

Project antenna patterns from spherical coordinates into cartesian for plotting purposes

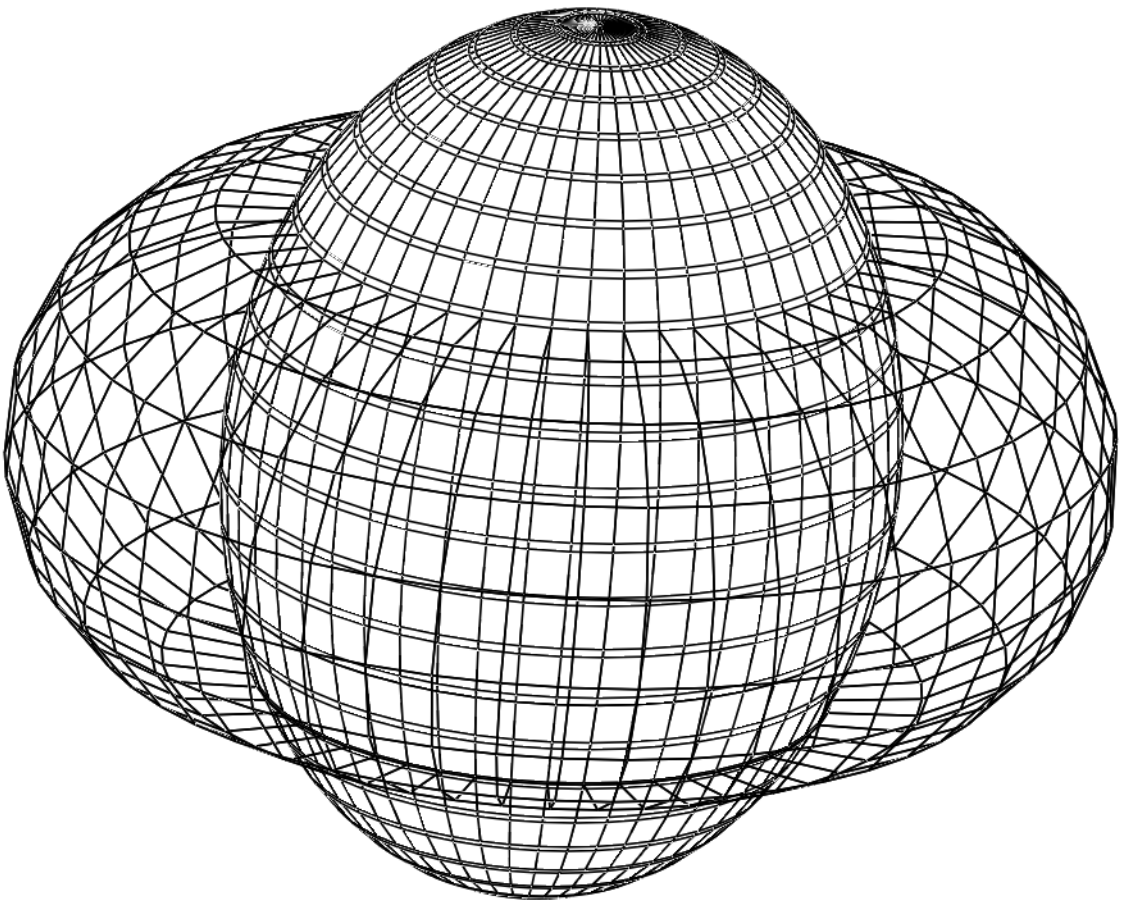
$X_{(m,n)} := f(\theta_m, \phi_n) \cdot \sin(\theta_m) \cdot \cos(\phi_n)$ $Y_{(m,n)} := f(\theta_m, \phi_n) \cdot \sin(\theta_m) \cdot \sin(\phi_n)$

$Z_{(m,n)} := f(\theta_m, \phi_n) \cdot \cos(\theta_m)$

$X\lambda 2_{(m,n)} := f\lambda 2(\theta_m, \phi_n) \cdot \sin(\theta_m) \cdot \cos(\phi_n)$ $Y\lambda 2_{(m,n)} := f\lambda 2(\theta_m, \phi_n) \cdot \sin(\theta_m) \cdot \sin(\phi_n)$

$Z\lambda 2_{(m,n)} := f\lambda 2(\theta_m, \phi_n) \cdot \cos(\theta_m)$

3D Plot



$(X, Y, Z), (X\lambda 2, Y\lambda 2, Z\lambda 2)$