

EE 483/583 Antennas for Wireless Communications (Spring 2024)

Homework 1

Thursday, January 18, 2024

- 1) 2.4bd
- 2) Plot polar radiation patterns for the U of 2.4bd (both unitless and in dB w/ 0 to -20 dB scale) in the elevation planes coinciding with the x - z plane (i.e., wrt θ when $\phi = 0$ & 180°). Attach copy of all work done (e.g., copy of command window, m-file, ...)
- 3) 2.7 for U given in (b)
- 4) 2.12 for U given in (c).
- 5) Plot polar radiation patterns for U of 2.12(c) (both unitless and in dB w/ 0 to -20 dB scale) in the elevation planes coinciding with the y - z plane (i.e., wrt θ when $\phi = 90^\circ$) and the azimuthal plane (i.e., wrt ϕ when $\theta = 90^\circ$). Attach copy of all work done (e.g., copy of command window, m-file, ...)
- 6) 2.14 for U given in (c).
- 7) 2.19 Modify problem so that the maximum gain is 18 dB and that of the first sidelobe is -14 dB.
- 8) 2.32 Modify problem so that the maximum gain is 15 dBi and the input power is 10 W. Also, determine the maximum radiation intensity.
- 9) **EE 583 only**- 2.31 [Hint: $J_1()$ is a Bessel function of the first kind of order 1.]

Due Thursday, January 25, 2024.