

PROBLEM SET #4
Due Friday, April 29, 2005

Reading assignment: *Stutzman & Thiele* 3.1–3.3

Problems:

1. *Stutzman & Thiele* Problem 3.1-1.(7 point)
2. *Stutzman & Thiele* Problem 3.1-5.(8 point)
3. The purpose of this problem is to investigate the end-fire array. (10 point)
 - (a) Calculate and plot the normalized field pattern of a linear end-fire array of $N = 12$ isotropic point sources of equal amplitude spaced $d = \lambda/4$ apart for the ordinary end-fire condition. Note that it's most convenient to align the array axis with the z -axis so that the pattern is only a function of θ .
 - (b) Calculate the directivity by graphical or numerical integration of the power pattern.
 - (c) Calculate the directivity using the approximate expression for end-fire arrays, $D \approx 4Nd/\lambda$, and compare with your answer from part (b).
4. *Stutzman & Thiele* Problem 3.2-3.(8 point)
5. *Stutzman & Thiele* Problem 3.3-5.(7 point)