

University of Tehran
School of Electrical and Computer Engineering
Antenna Theory, Spring 2017
Instructor: Dr. L. Yousefi

Homework#5

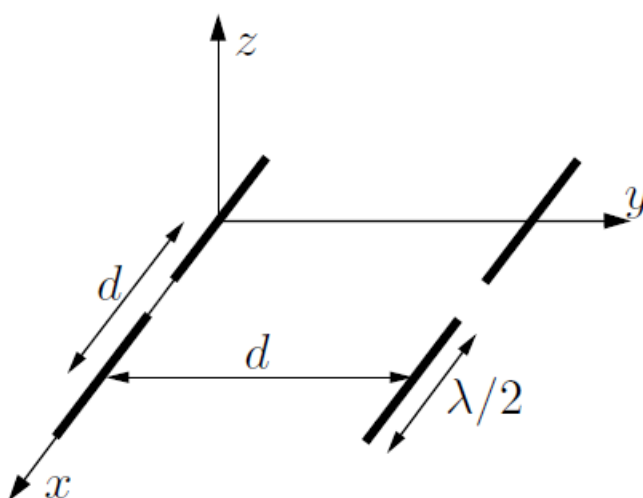
Due Date: 30 Ordibehesht

Q1, 10 Marks

Find the relationship for the directivity of an N-Element End-Fire Linear Array.

Q2, 30 Marks

A 4-element array of half-wave dipoles is shown in the following figure. Use array theory to find the normalized radiation pattern and plot it on xoz and yoz planes for $d = \lambda/2$, and λ . All excitations have equal amplitude and phase.



Q3, 20 Marks

Design a Dolph-Tschebyscheff broadside array of 5 elements with a -30 dB side lobe level.

Q4, 20 Marks

Using Fourier Transform method, find a continuous line source current that provides the following Space Factor:

$$SF(\theta) = \sin(\pi \cos \theta)$$

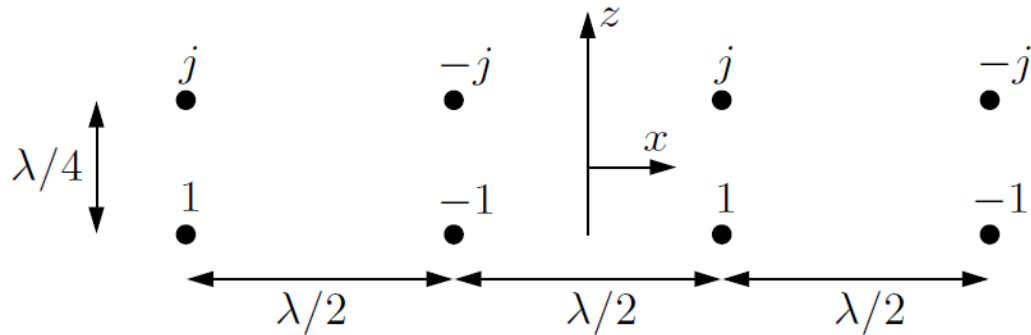
Q5, 30 Marks

Find the array factor of the following array, with excitations shown in the figure. Plot the array factor in xoy and xoz planes.

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Q6*, 20 Bonus Marks

Consider a full-wave dipole and a full-wave monopole above a perfect ground plane. Use array theory to find the radiation pattern of each case.

