
Fundamentals of Electromagnetic Fields and Waves: I

Fall 2007, EE 30348, Electrical Engineering, University of Notre Dame

Assignment 9

Due date: **Friday, November 30th.**

Please attach this sheet on top of your solutions. Sketch figures wherever necessary.

1) Electric Potential Φ for spheres, loops, and quadrupoles:

Iskander: Problem 4.1, Problem 4.2, Problem 4.4.

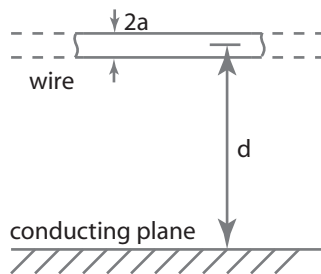
2) Capacitance and Electrostatic Energy:

Iskander: Problem 4.5, Problem 4.8, Problem 4.6, Problem 4.7.

3) Laplace's and Poisson's Equation Solutions:

Iskander: Problem 4.9, Problem 4.10, Problem 4.11, Problem 4.12, Problem 4.13.

4) Evaluating capacitance using Kelvin's image-charge method:



Consider a metallic wire of radius a , at a distance d from a conducting plane as shown in Figure 1. Determine the capacitance of the system. (Hint: Use the image-charge method. You might find Example 4.9 from Iskander useful.)

Figure 1: Setup for Problem 4.