

Unit 10: Electrostatics

LAB: Electric Fields

Objectives:

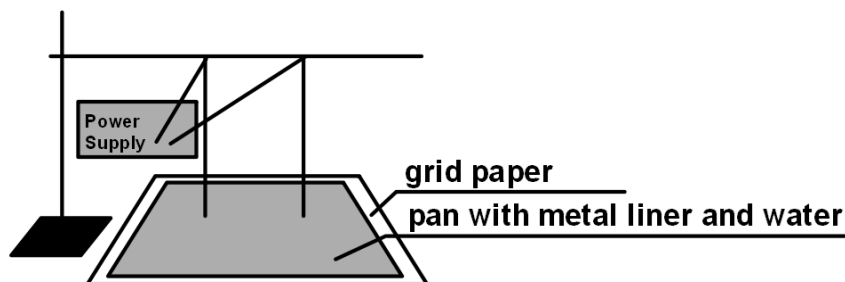
- Analyze the electric potential at various points in an electric field in order to model the electric field and determine the charges of the point charges generating the field.

Equipment:

- Power supply, plastic pan with metal ring inner liner, leads, voltmeter, grid paper

Procedure: Due to safety issues related to this lab, part of the procedure is outlined for you regarding setup.

- Setup:
 1. Fill the pan with just enough water that the bottom of the pan is entirely covered in water. Set up the materials according to the following diagram. The leads from the power supply should be taped to the ring stand so that only the very tips of the leads touch the top of the water in the pan. Use the alligator clamp to attach the black lead from the PASCO probe to the metal pan liner. **DO NOT TURN ON THE POWER SUPPLY UNTIL TOLD TO DO SO.**



2. Connect the PASCO probe to view the voltmeter. Change the precision to three.
 3. The instructor will turn on your power supply when you are ready to collect data.
 4. Use the red lead of the Voltage sensor to measure the voltage in each square of the grid. Have a group member record these on a separate piece of grid paper. If a cell contains a hanging lead, hold the red probe lead in the water near the hanging lead without touching the hanging lead. **DO NOT BUMP THE HANGING LEADS, OR YOU WILL HAVE TO START OVER.** Turn off the power source immediately when you've finished collecting the data.
- Use Excel to create a 3-D surface chart, which must be included in your report.
 - Determine the charge of each hanging point (lead) in the water.
 - Include a to-scale electric field diagram in your report.