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Screen Electroscope: Charge Distribution Electroscope
Part#: SS18155

Background

The screen electroscope is used to demonstrate the effect of surface curvature on the strength of an electric field. A characteristic of conducting objects at electrostatic equilibrium is that electric fields are strongest at locations along the surface where the object is most curved. The curvature of a surface can range from absolute flatness on one extreme to being curved to a blunt point on the other extreme. This electroscope has a flexible conductive fabric the is joined by 3 insulated metal pillars. The pillars can be manipulated to change the surface curvature of the fabric. When charged, the red strings embedded in the fabric will deflect. The degree of deflection will depend on how the fabric is situated (straight line vs curved).

Setup & Use

Remove the screen electroscope from the package, and set up per the photo below. Note that it is best to leave the electroscope out so the fabric has time to relax. A **very cool** iron can be employed to assist with any wrinkles. Make sure that all strings are centered in the holes to start. Use a Van De Graaff generator, Wimshurst Machine or Portable Van De Graaff (Fun Fly Stick) to charge the electroscope. If using a regular Van De Graaff generator, attach the main sphere to one of the metal pillars using a connecting wire. A Wimshurst machine can be attached by running a connecting wire from one of the metal posts that hold the discharge electrodes to one of the metal pillars on the electroscope. Deflection will vary according to the amount of curvature (areas with greater curvature will show more deflection) and electrostatic field strength. Don't forget to demonstrate Faraday by making a circle and noting the absence of charge in the center of the sphere.