

Variable Capacitor I – Giant Capacitor

Apparatus

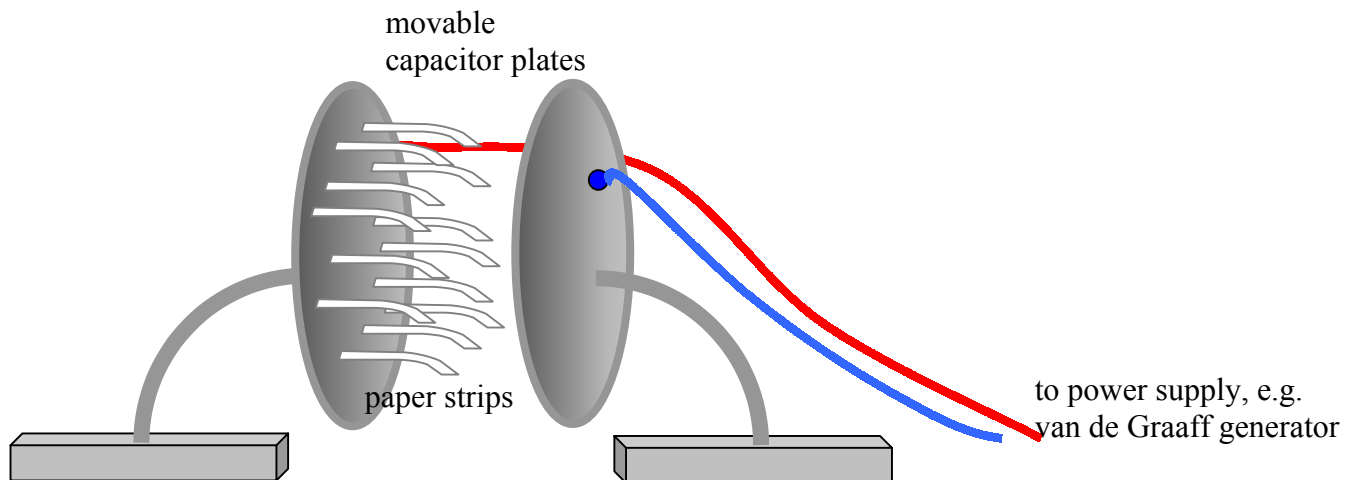
van de Graaff generator, large parallel plate capacitor with plates that slide towards or away from each other, thin strips of paper taped at one end to one plate of the capacitor

Action.

The students examine the capacitor and explain how the capacitance is varied. They then charge the capacitor and observe the behaviour of the paper strips, and sketch field lines for the electric field between the plates.

The Physics

The capacitance is inversely proportional to the separation of the plates, moving the plates closer together increases the capacitance. The paper strips lift and align with the field lines when the field is strong enough. The strips become charged by the plate to which they are attached, and are both repelled by this plate and attracted towards the opposite plate.



Accompanying sheet

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Examine this variable capacitor.
How can the capacitance be varied?

Charge up the capacitor.
What happens to the paper strips? Why?

Sketch the field lines for the electric field between the plates.