

Electro-gravitational hysteresis Bondi dipole engine

The following is based on (1)-(14.12) in “Electro-gravity via geometric chronon field and on the origin of mass” in ResearchGate.net , which is better and corrects a peer reviewed paper from 2017.

See: “Hysteresis dielectric effect after removing the plates”.

In a parallel plates high voltage capacitor, the dielectric dipoles align opposite to the external field. There are permanent dipoles and induced dipoles. The permanent dipoles may have a stronger gravitational dipole / Hermann Bondi dipole, than the external field, which altogether cancels out the external Bondi dipole by the plates. However, the opposite alignment of the dielectric dipoles can be used in a dynamic setting to actually build and electro-gravitational engine.

The electro-gravitational hysteresis effect after removing the plates depends on the charge density on the plates before they were removed and on the hysteresis property of the dielectric layer.

$$g \approx \left(\frac{1}{\varepsilon} - 1\right) \frac{Q}{A} \sqrt{\frac{\pi G}{\varepsilon_0}}$$

$$g \approx \left(\frac{1}{\varepsilon} - 1\right) \frac{CV}{A} \sqrt{\frac{\pi G}{\varepsilon_0}}$$

$$g \approx \left(\frac{1}{\varepsilon} - 1\right) \frac{\varepsilon \varepsilon_0 AV}{Ad} \sqrt{\frac{\pi G}{\varepsilon_0}}$$

$$g \approx (1 - \varepsilon) \frac{V}{d} \sqrt{\pi G \varepsilon_0}$$

Assume $\varepsilon = 4000$, $V = 10000 \text{ Volts}$, $d = 1 \text{ mm} = 0.001 \text{ Meter}$.

We can consider $1 - \varepsilon = -3999 \sim -4000$.

$$\begin{aligned} \sqrt{\pi G \varepsilon_0} &\approx 4.3087586002548416470445270690079e-11 \text{ (C}^2 \cdot \text{kg}^{-1} \cdot \text{m}^{-3} \cdot \text{s}^2 \text{m}^3 \text{kg}^{-1} \text{s}^{-2})^{(1/2)} \\ &\approx 4.3087586002548416470445270690079e-11 \text{ (C} \cdot \text{kg}^{-1}) \end{aligned}$$

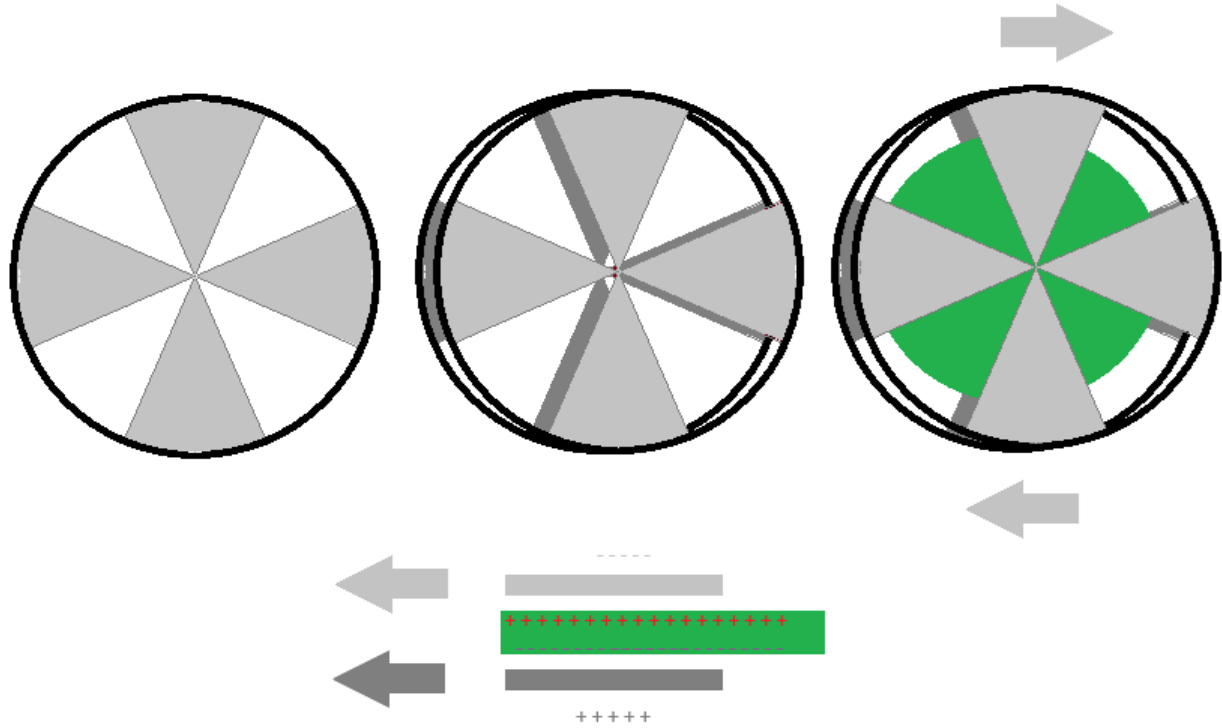
$$(1 - \varepsilon) \frac{V}{d} \sqrt{\pi G \varepsilon_0} \approx 4000 * 10000 * 1000 \sqrt{\pi G \varepsilon_0} \approx \mathbf{1.723503441019 \text{ Meter} * \text{Sec}^{-2}}$$

The standard gravity is $g \sim 9.80665 \text{ m/s}^2$, so we have about **0.17574844 g** if the hysteresis is perfect once the dielectric of 1mm thickness moves out of the plates.

All we need is a material with this hysteresis effect, A.K.A ferroelectric material, where most of the molecular mass is between the poles of each dipole, where dipoles in other directions other than opposite to the external field by the plates before they are removed are negligible, with a high relative dielectric constant of about **4000** that has a breakdown voltage higher than **10000 volts / 1mm**. Plates of 10 cm^2 , will allow easy measurement.

Experiment 1: rotate disk-shaped plates of a capacitor with missing sectors of half of the area of the disks, one clockwise and one anticlockwise to achieve mechanical stability such that the missing

sectors of the top disk will match the ones of the bottom disk, while applying 10000 over 1mm or more. The disk area will be at least 0.01 Meter², the relative dielectric constant will be between 2000 to 4000. We should be able to achieve a weight reduction of a quarter of 0.17574844 g, about 0.04393711 g. The disk rotation can be also in the first direction, as in the following figure.



Experiment 2 (much less efficient): Feed the capacitor with high DC spikes and use whole plates. This method requires ferroelectric materials with properties that are hard to achieve. Lead Zirconate Titanium – PZT is ferroelectric and may be suitable. Lead provides high mass density which is preferable in a Bondi dipole because a higher mass, more than twice the density of titanium is expected to generate more pseudo-force due to the gravitational dipole.

Chat GPT answer on 10000 volts/1mm, relative dielectric constant 4000 and hysteresis effect

A dielectric material with the properties you're describing—high relative permittivity (around 4000), high breakdown voltage (around 10,000 V/mm), and exhibiting a hysteresis effect (where the material retains polarization after the external electric field is removed)—is quite rare, as the typical dielectric materials with such high permittivity tend to be ceramic or polymer-based, and they do not usually exhibit significant hysteresis under normal conditions.

However, there are materials that come close to what you're describing, though most of them fall under the category of **ferroelectric materials**, which exhibit hysteresis due to their intrinsic polarization effects.

Ferroelectric Materials

Ferroelectric materials are a class of dielectric materials that exhibit hysteresis, meaning that they retain polarization even after the external electric field is removed. This is due to the alignment of electric dipoles within the material. Common ferroelectric materials include:

- **Barium Titanate (BaTiO₃):**
 - **Relative permittivity:** Can range from about 1000 to 5000, depending on temperature and processing.
 - **Breakdown voltage:** High, in the range of 10,000 V/mm or more in some forms.
 - **Hysteresis effect:** Barium titanate and similar materials are well-known for their ferroelectric behavior, including a hysteresis loop when subjected to an electric field.

However, while BaTiO₃ has a relatively high dielectric constant and can exhibit hysteresis, achieving such high breakdown voltage (10,000 V/mm) in practical applications may be difficult due to material limitations in terms of mechanical and electrical strength.

Other High-Dielectric Materials

- **Lead Zirconate Titanate (PZT):** Another ferroelectric material often used in high-voltage applications, but it typically has a lower dielectric constant compared to barium titanate (usually below 2000, depending on composition). **It has a lower relative dielectric constant but may compensate for it by having a high breakdown voltage / distance (author's remark, not Chat GPT). The mass density is good due to lead.**
- **Strontium Titanate (SrTiO₃):** While it can exhibit high permittivity in certain conditions, its ferroelectric properties are generally not as pronounced at room temperature.

Other Considerations

- The dielectric constant of 4000 is exceptionally high, and materials with such values often face trade-offs in terms of other properties like breakdown voltage, mechanical properties, and thermal stability.
- Achieving a breakdown voltage of 10,000 V/mm requires a material that is extremely strong electrically, and ferroelectric materials might not meet these requirements in typical capacitor designs.

Conclusion

While there are ferroelectric materials such as **Barium Titanate (BaTiO₃)** that exhibit high permittivity and hysteresis, achieving a **breakdown voltage of 10,000 V/mm** is highly demanding. The combination of these specific properties might not be found in a single material under standard conditions, but **ferroelectric ceramics** are the closest candidates for your needs. You may need to look into advanced processing techniques or composite materials to achieve this ideal combination.

