Novel form of Induction offers Anomalous Energy Production

©Cyril Smith, February 2026

1. Introduction

Externally applied force on electrons within electric conductors is generally called voltage induction that to date has always used *electric* force applied to the electron's charge, not *magnetic* force applied to its magnetic dipole. The historical evolution of electrical systems has used *electric* force on conduction electrons induced via the time rate-of-change of magnetic vector potential in transformers, and the Lorentz force in electric generators and motors. It is known that electrons have a magnetic dipole moment in addition to their mass and negative charge; its value is the Bohr magneton μ_B = 9.274×10^{-24} Am^2. It is also known that an electron magnetic dipole can endure a *magnetic* force when it is within a non-uniform magnetic field, perhaps the most well-known example being electron beam splitting in the Stern Gerlach experiment. *Electric* forces on electrons are significantly greater than any practically induced *magnetic* force, and there are significant limitations on the use of the latter, so it is perhaps not surprising that this branch of electromagnetic induction has been neglected and considered of no interest. So why the interest now? The next section answers this question.

The force F_x in the x direction on a magnetic dipole of moment μ aligned with a non-uniform magnetic field is given by

$$F_x = \mu \frac{dB_x}{dx}$$

Replacing μ with current *i* flowing around loop area *A* and evaluating the differential energy *dW* for the work done by the force moving over the distance *dx* we obtain

$$dW = F_x \cdot dx = iA \cdot dB_x.$$

The voltage induced into the current loop is

$$V = A \frac{dB_x}{dt}$$

yielding a power *P* taken from the current source as

$$P = iA \frac{dB_x}{dt}$$

The energy *dW* taken from the current source over the time *dt* is then

$$dW = P \cdot dt = iA \cdot dB_x = F_x \cdot dx.$$

The output energy derived from force on a current loop moving within a non-uniform magnetic field is supplied from the current source of that loop. For electrons the source that perpetually maintains its dipole moment is hidden to us, hence energy gained in this system could be anomalous offering possibilities in the search for renewable energy. It is believed that this process within magnetic core materials has never been seriously considered, current dogma saying that such forces on the electrons are conservative.

2. Flux Concentration Induction

In this paper we examine conduction electrons within electrically conductive magnetically soft materials that have high magnetic permeability, and the field is deliberately made non-uniform, focussing on iron. We develop a system where flux concentration occurs due to the tapered geometry of the ring cores used and examine means for using the field-gradient driven movement of conduction electrons within the core to deliver energy to an external load. The force is so different from the well-known induction forces that it deserves its own name. I have chosen the acronym Flux Concentration Induction (FCI) for this. It has some significant limitations. The field change along the concentrator limits the output voltage to about 50μV per Tesla; since available magnetic permeable conductors have a saturation limit in the order of 1 Tesla that 50μV is the maximum available voltage from this technique. This leads to low voltage high current, i.e. very low load resistance values. Further to this, any attempt to use the induced force to drive the electrons into normal (non-permeable) conductors takes the electrons from a high magnetic field to a zero magnetic field, that gradient producing a reverse force that negates the induction. In light of these limitations, it is perhaps not surprising that FCI has not been considered to have any practical applications.

Here we discuss methods to overcome the limitations. While it is not expected that initial experiments will reveal so-called "free energy", they should allow measurements to be taken that will enable further development in this new area.

3. An unusual ring core

The use of tapered material to concentrate flux is well known, but its use within a transformer core is unusual. Here we consider a ring core that has tapers that concentrate the flux in one part of the ring, as depicted in figure 1.

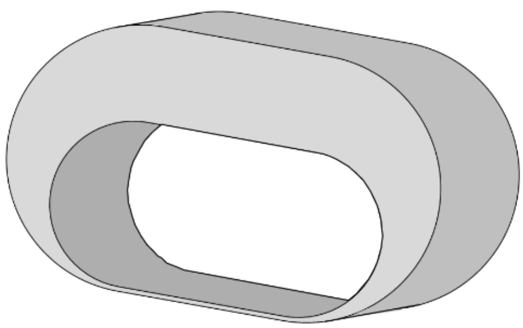

Figure 1. Special ring core

With coils wound around each curved section driven with current we obtain the field shown in figure 2.

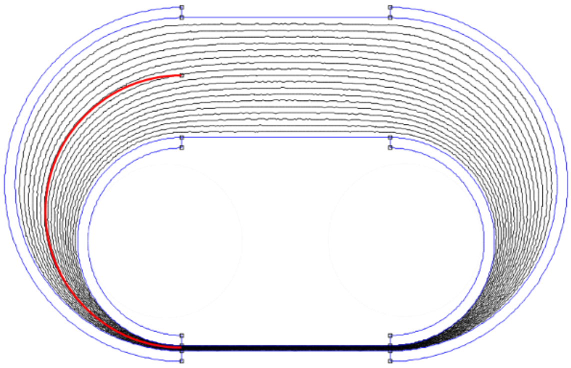

Figure 2. Showing flux concentration.

This was obtained using the FEMM 2D finite element simulator; the red semi-circle line within the flux is used for the chart shown in figure 3 which shows the field strength along that line where the change from minimum to maximum is over 1 Tesla in pure iron.

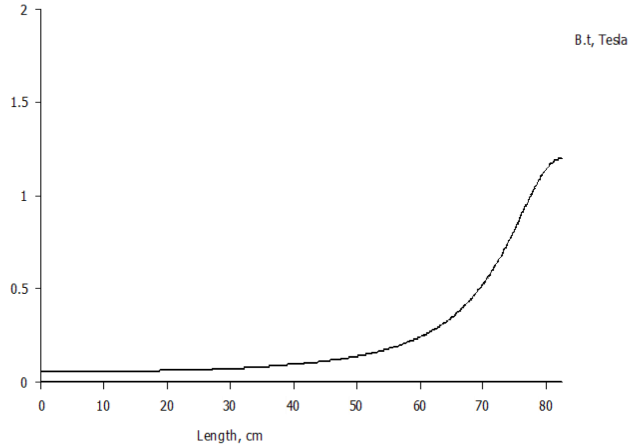

Figure 3. Magnetic field rise in the flux concentrator

Conduction electrons in the iron are forced towards the high flux creating a surfeit of electrons at the bottom and deficit at the top. The net result is the appearance of negative charge and positive charge at these extremes as depicted in figure 4. We have a small but significant electric potential from top to bottom. This electric effect in magnetic material has not been used in the past for reasons discussed earlier. Note that in this transformer core driven with AC the peak flux occurs twice per cycle, hence the voltage from top to bottom alternates at twice the frequency sitting on a DC value, like unsmoothed rectification.

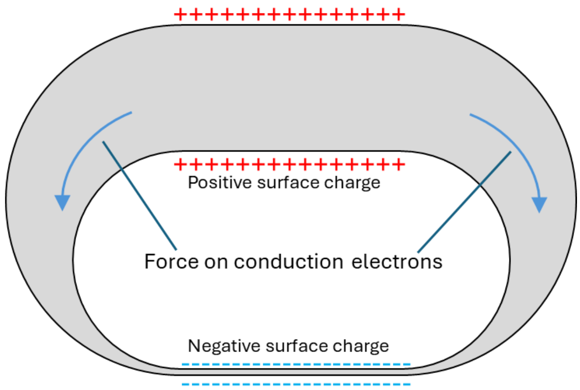

Figure 4. Surface charge from electron movement

4. Using this effect

Attempts to measure the DC value for iron wire placed against a permanent magnet have indicated the rectification effect in that reversing the magnet did not reverse the potential, the high field end was always negative. However, getting useful voltage values was problematical, what should have been tens of microvolts was almost unmeasurable. This could be due to the measurement requiring electrons to pass from the iron into the conductors connecting to the instrument. Such electrons are then passing from the high magnetic field to zero field, that gradient creating a reverse force that negates the wanted measurement. If we are to use the potential difference to good effect, we must keep the electrons within the iron. As we are now dealing with alternating potential and alternating charge, the obvious way forward is to use capacitive loading where the magnetic force does not drive conduction current external to the core but does drive displacement current. The iron at the top is used as one electrode of a parallel plate capacitor, separated from its other electrode by an appropriate dielectric sheet. Similarly at the bottom, then the two capacitors can be connected as shown in figure 5.

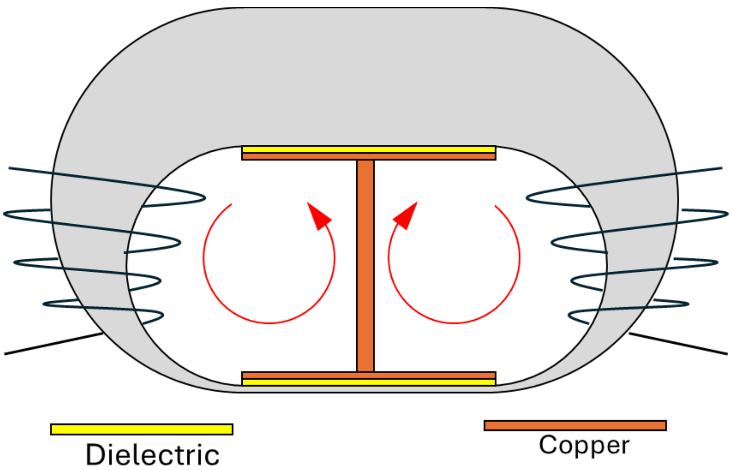

Figure 5. Capacitive connections to the core

The displacement currents flowing around this arrangement, depicted by the red arrows, are exactly right for them to influence another ring core, this one being conventional and shown in figure 6 set within the flux concentrator core.

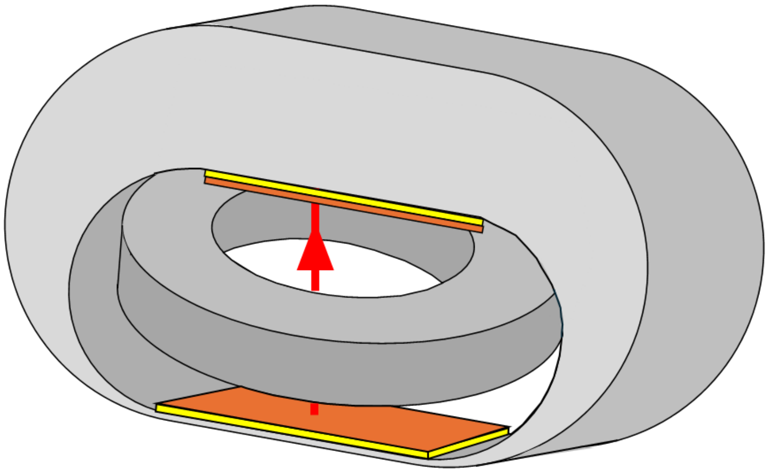

Figure 6. Both cores

This second ring-core would have a multiple turn winding to give a measurable voltage output from the displacement current shown in red passing through that core. When given a resistive load that results in measurable power out. The output power cannot be traced back to an increase in input power, and the measurements might show this.

5. Calculations

With the electron's magnetic dipole moment of value μ_B (the Bohr magneton) the force in the x direction F_x is given by

$$F_x = \mu_B . cos\theta \frac{dB_x}{dx}$$

Where θ is the angle between the dipole axis and the x axis. This is equivalent to the electron being within an E field of value

$$E_x = \frac{\mu_B}{e} . cos\theta \frac{dB_x}{dx}$$

For typical grain-oriented material for transformers the conduction electrons will tend to be aligned along the grains but have a mixture of spin-up (θ=0) and spin-down (θ=180°), so cosθ can be replaced by the spin polarization factor P. Using $P = \frac{B}{B_{REM}}$ applied to the B values in figure 3, where B_{REM} is the remanence taken as 1.8 Tesla, and integrating the values of E along the contour in figure 2 we arrive at a voltage of 23μV between the top and the bottom of the special ring core.

Electrically conductive core material places an upper frequency limit that then demands high value for the two capacitors in figures 5 and 6, values that cannot be practically provided by the simple parallel plate capacitors of shown in the figures.

However, the core will be made from multiple laminations so there exists the possibility of turning the top and bottom parts of the core into multiple plate capacitors. The core previously simulated in FEMM had a 10mm thickness that with typical 0.2mm laminations would consist of a stack of 50 or so. The core construction could then follow as depicted in figure 7 where the capacitive regions have copper electrodes separated from the iron laminations by thin high-K dielectric, while in other regions there is just low cost insulation.

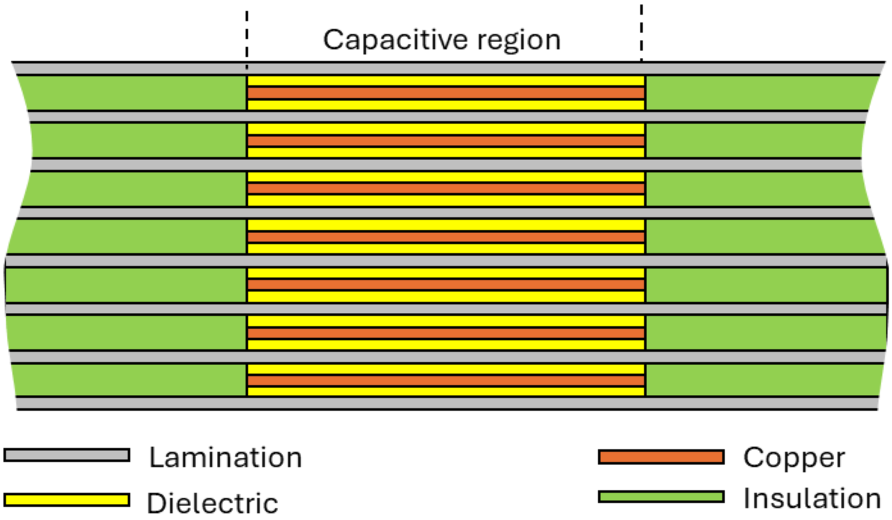

Figure 7. Capacitive regions of core

If the bottom of the special core has 51 laminations each 1mm X 40mm that create 100 capacitors in parallel, each one having a 40 square mm dielectric sheet between two electrodes. If we assume 0.1mm titanium dioxide as the dielectric ($K \approx 90$) the total capacitance is 0.032 μF. That represents an impedance of 5Ω at 1MHz so we can expect displacement current in the microamp region, which should be enough to generate measurable voltage on the step-up ring core. Note that recent more exotic titanate dielectrics offer much greater current to create useful output power.

6. Conclusion

An innovative type of transformer has been offered that uses magnetic forces to drive electrons within electrically conductive flux concentrators to deliver power output. This offers possibilities for renewable energy.