# Euler's Coil Technology Experiment 1

**Aim:** To Distinguish between two hypothesis.

Hypothesis A:
Transformer is a device that transferring electrical energy from Primary Coil to Secondary Coil. For an ideal transformer:

From Faraday's Law

$$\frac{V_S}{V_P} = \frac{N_S}{N_P}$$

**For ideal transformer**

The voltage ratio is equal to the turns ratio, and power in equals power out.

From conservation of energy

$$P_P = V_P I_P = V_S I_S = P_S$$

Hypothesis B:

First Round Induction from Primary coil to Secondary coil:

$$V(Primary\ coil) = \sin(t)$$
$$V(Induced\ Secondary\ coil) = -V'(Primary\ coil) = -(\sin(t))' = -\cos(t)$$

Notice that $\sin(t - Pi/2) = -\cos(t)$

Hypothetical Induction from Secondary coil to Primary coil:

$$V(Induced\ Primary\ coil) = -V'(Induced\ Secondary\ coil) = -(-\cos(t))' = -\sin(t)$$

Notice that $\sin(t - Pi) = -\sin(t)$

The description of the energy transferring process should be

$$E(Original\ Primary\ coil) \rightarrow E(Induced\ Secondary\ coil)$$
$$E(Induced\ Secondary\ coil) \rightarrow E(Induced\ Primary\ coil)$$
$$E(Induced\ Primary\ coil) = -E(Original\ Primary\ coil)$$
$$E(Final\ Primary\ coil) = E(Induced\ Primary\ coil) + E(Primary\ coil)$$
$$E(Final\ Primary\ coil) = E(Primary\ coil) + (-P(Primary\ coil))$$
$$E(Final\ Primary\ coil) = E(Primary\ coil) - E(Primary\ coil)$$
$$E(Final\ Primary\ coil) = 0$$

Thus:

$$V(Primary\ coil) = V(Primary\ coil) + V(Induced\ Primary\ coil)$$
$$V(Primary\ coil) = \sin(t) + (-\sin(t))$$
$$V(Primary\ coil) = \sin(t) - \sin(t)$$
$$V(Primary\ coil) = 0$$
$$V(Induced\ Secondary\ coil) = -\cos(t)$$

Generically speaking:
Given initially when V(Primary coil)=A(t) and V(Secondary coil)=B(t),
What we have at its steady state,

$$V(Primary\ coil) = A(t) - {}^{n}_{1}B(t) + {}^{n}_{2}A'(t) - {}^{n}_{3}B''(t) + {}^{n}_{4}A'''(t) - {}^{n}_{5}B''''(t) \ldots\ldots$$

$$V(Seconady\,Coil)=B(t)-\frac{n}{1}A(t)+\frac{n}{2}B'(t)-\frac{n}{3}A''(t)+\frac{n}{4}B'''(t)-\frac{n}{5}A''''(t).....$$

Original Energy content of each coil:

$$E(Primary\,Coil)=\int A(t)\,dt$$
$$E(Secondary\,Coil)=\int B(t)\,dt$$

Final Energy content of each coil(if undisrupted):

$$E(Primary\,Coil)=\int (A(t)-\frac{n}{1}B(t)+\frac{n}{2}A'(t)-\frac{n}{3}B''(t)+\frac{n}{4}A'''(t).....)\,dt$$
$$E(Secondary\,Coil)=\int (B(t)-\frac{n}{1}A(t)+\frac{n}{2}B'(t)-\frac{n}{3}A''(t)+\frac{n}{4}B'''(t).....)\,dt$$

Of course. Since:

$$E(O.\,Primary\,Coil)+E(O.\,Secondary\,Coil)=\int A(t)\,dt+\int B(t)\,dt$$
$$E(f\,Primary\,Coil)+E(f\,Secondary\,Coil)=\int (A(t)-\frac{n}{1}B(t)+....)\,dt+\int (B(t)-\frac{n}{1}A(t).....)\,dt$$

Therefore, obviously

$$E(O\,Primary\,Coil)+E(O\,Secondary\,Coil)\neq E(f\,Primary\,Coil)+E(f\,Secondary\,Coil)$$

On the other end, in the normal transforming process,
Given initially when V(Primary coil)=A(t) and V(Secondary coil)=0
Its steady state could be given by substituting B(t)=-A'(t) ,

## Setup:

Three Identical transformers with 1:1 Primary to Secondary ratio, both connected to A.C., and their outputting voltages are monitor by two oscilloscopes. An identical load may connected to both of them to prevent short circuit. The inputting frequency of two of them is controlled by an I.C which is adjustable. Circuit 1 is operated with a constant electrical power supply, Circuit 2 is operated with a transitory electrical power supply of frequency *f*. Circuit 3 is also operated with a transitory electrical power supply of frequency *f* except it doesn't carry any loading.

## Expected Result:

If Hypothesis A is right, then we would expect the voltage variation would only happen when its energy is supplied by an A.C source, therefore we should only observe periodic voltage variation in Circuit 2 when A.C power is on. The period is controlled by the supply frequency *f*. Likewise, there shouldn't be any difference between Circuit 2 and Circuit 3 except that the output of former is lower than later as some energy is consumed by the loading.
If Hypothesis B is right, then we would expect a dramatic difference of the voltage variation patterns between circuit A, B and C. Since for A, the constant outputting electrical energy from A.C may suppressed the infinite recursive interaction. However, for B, that the A.C only play the role of adjusting the voltage input periodically, thus leave plenty of room for the infinite recursive interaction to happen.

This hypothesis predict that we could still observe the voltage variation when the A.C supply is off. It would be very interesting to investigate how the supply frequency $f$ interact with the voltage created by infinite recursive interaction between two coil. The author suggest the existence of a Resonance frequency which we were able to maximizing the outputting electrical energy. For C, since the electrical energy is not consumed by any loading, therefore all the electrical energy of the Secondary coil is left to interact with the Primary coil, thus we expect higher amplitude of voltage variation than with B. Therefore A and B should be approximately equal in output, while C should always produce a higher output than B.

## Result:

## Discussion:

Setup A and B is use to verify the experimental hypothesis that the infinite recursive interaction do happen therefore we could replace persistent voltage supply with transitory voltage supply without affecting the function of the system(implying 'extra' energy induce in the process), B and C is to probe the characteristic of such a system. Is it true the infinite recursive interaction stop there because of the demand? So theoretically that the demand of loading may prevent the system from reaching its steady state, therefore we see only finite amount of electrical energy; but when we allow the system to reach its steady state before we drawn any energy from it, we would then have unlimited supply of energy. With these experiment we could thus establish the postulate of this new Physics.