# Has it ever been proven, or disproven, that a coincident set of mutual inductances are always conserved?

Is this why mutual inductance is not included in Kirchhoff's Current Law? Because it can't be conserved all of the time and under all circumstances?

Or is energy conservable but the potentialities of electrical reactance, namely: capacitance, inductance, phase shifts and frequency, not conservable since they're not a manifestation of kinetic energy?

Both of Kirchhoff's Current and Voltage Laws seem to focus merely on the nodes in between electrical connections and ignore magnetic couplings. Is this because mutual inductance is not considered to be another type of node and is, thus, not always entropic?

I have discovered a mathematical relationship among a set of three interconnecting mutual inductances which do not conserve their energy over time if two of these mutual inductances possess at least a pairing of self-inductances. This relationship is ...

1. The first mutual inductance of $MI(1)$ is the largest of the three. Its minimum value is the golden ratio $\frac{\sqrt{5}-1}{2}$ of approximately 62% magnetic coupling between a pair of large self-inductances and another pair of very small self-inductances. Let's assume that each large self-inductance (of its pair) is labeled and set to the value of $H(1) = 1H$ and that each small self-inductance (of its pair) is $H(2) = 2µH$. And let's also assume a pair of alternate magnetic coupling coefficients among all four coils is going to be exactly the golden ratio (for one option) versus exactly 70% (for the alternate option) for the purposes of this question.
2. Second mutual inductance: two options …
    1. The second mutual inductance of $MI(2)$ magnetically couples the large pair of inductors $H(1) = 1H$ to a fifth single self-inductance $H(3) = 2µH$ of the same self-inductance as is each of the second pair of small self-inductances $H(2) = 2µH$. This second magnetic coupling $MI(2)$ can be found by subtracting the first mutual inductance $MI(1)$ from unity and taking the square root $= \sqrt{ 1 - MI(1) }$. So, if the first magnetic coupling $MI(1)$ is 70%, then the second magnetic coupling $MI(2)$ is approximately 55%.
    2. In the alternative, if the first magnetic coupling is exactly the golden ratio $= \frac{(\sqrt{5} - 1)}{2}$, then the second magnetic coupling can be found by an equivalent method of calculation by squaring the golden ratio. So, $\sqrt{1 - \left( \frac{\sqrt{5} - 1}{2} \right) } = {\left( \frac{\sqrt{5} - 1}{2} \right)} ^ 2 \approx 38$%.
3. Third mutual inductance, two options …
    1. If the first magnetic coupling is exactly the golden ratio $= \frac{(\sqrt{5} - 1)}{2}$, then the third magnetic coupling can be found by taking the cube of the golden ratio $= \left( \frac{(\sqrt{5} - 1)}{2} \right) ^ 3$. This is equivalent to subtracting two from the square root of five $= \sqrt{5} – 2$.
    2. Otherwise, if the first magnetic coupling $MI(1)$ is greater than the golden ratio, then this third magnetic coupling $MI(3)$ must be tweaked by trial and error to discover its most efficient percentage of unity. So, if the first magnetic coupling $MI(1)$ is 70%, and the second coupling $MI(2)$ is approximately 55%, then the third coupling $MI(3)$ will be

> found by tweaking downwards the cube of the second magnetic coupling $(MI(2)) ^ 3 = MI(3)$ in order to achieve maximum efficiency at a value of approximately 26‰ (ppt = parts per thousand) simulated in the circuit, whose example, is below.

The theoretical efficiency of this anomaly can be simulated in Micro-Cap 12[1] on a 64-bit computer which minimizes the likelihood of simulator round-off error to the point of unnoticeable obscurity.

And this simulated circuit has most of its nodes shorted out to reduce the likelihood that the nodal analysis of Kirchhoff's Current Law plays a pivotal, or exclusive, role. Likewise, this poses a question to adherents of Conservation: *What is Going On, Here?*

A screenshot of its schematic is here ...

https://commons.wikimedia.org/wiki/File:Simplest-overunity-circuit-you-will-ever-see_v4c,_schematic,_v3.png

A screenshot of its output at 94 milli seconds, without any apparent limit to its escalation towards infinite oblivion, is here ...

https://commons.wikimedia.org/wiki/File:Simplest-overunity-circuit-you-will-ever-see_v4c,_Tesla_Motors_input_requirements_at_94ms.png

Its simulation file is located here ...

http://vinyasi.info/mhoslaw/Parametric%20Transformers/2022/Nov/simplest-overunity-circuit-you-will-ever-see_v4c.cir

And another copy is here ...

https://ufile.io/5tc2xv8w

BTW, which choice of mutual couplings, be it the minimum coupling of the golden ratio $= \frac{(\sqrt{5} - 1)}{2}$ for the first coupling of $MI(1)$, or anything greater than this, will be determined by the circuit to which it applies. In other words, one set of couplings may work in one circuit but not in any another. This concept is a broad generalization whose particular relationships of magnetic couplings may vary from one circuit to another.

I may have asked a variation, or a repetition, of this question before now on some other StackExchange forum, or on this one, but I never understood this question within the context of Kirchhoff's Current Law until now. So, I feel that this is not a duplicate enquiry.

1 http://www.spectrum-soft.com/index.shtm