A script for the “the search for answers” part 10 video. By Russ Gries

11-22-17

Thanks for all the feedback on the last video.

We are going to start out with a brief thought on how magnetism is formed, and in more detail in another video,

Then we will talk about an analogy using water.

Then we will do some real world math using current understanding about inductors to prove the point.

We are doing physics. Do not forget this. Not electrical engineering.

**Note.

Talk about switch closure again. Nano second switching.

**Read:

The more atoms you align for lowest amount of power the more efficient your system is. A permanent magnet is just that. Alignment of atoms.

One could also say it is electron spin alignment. But will just say Atom Alignment to make it easier.

Spin Alignment is where magnetism comes from. Even in a wire. One can look up “magnetic moment” for more info.

You only need a small amount of current to make the alignment. Then use voltage to push out the electrons from the wire. Generating the field.

The current acts as a catalyst to align the atoms...

But the current dose not participate in the release of the magnetic field.

We are taught that the more current the more the magnetic field.

But current is not what makes the magnetism. Current only aligns the atoms. The voltage “pushes” out the field using “high pressure”

**Note. :

Talk about heat and how more heat means more chaotic alignment, also the is the reverse of a super conductor. So the more heat you generate the more current you need to overcome that misalignment.

**Note:

Talk about using hydraulic pressure, instead of flow...

**Read.

It's like water in a pipe. But this analogy only goes so far. You will see in the end that you can't compare water with electricity for many reasons. But it makes for a great mechanical analogy. And gets the point across.

Flow = current, Pressure = Voltage

What happens when we don't let current through a wire? Using a water pipe as in analogy.

We can talk about a water pipe with a closed end acting like an inductor that's being charged.

Pressurize it with a pump. ** make a drawing.

There will be no "flow" at the closed end, yet a flow at the pump end.

However the pressure is pushing out on the walls of the pipe as more pressure is applied. This pressure acts fast on the walls of the pipe due to the water not being compressible.

So let us call this pipe expandable. Like a rubber hose under pressure. As if that what the magnetic field is.

If the water could expand out in the rubber hose like a magnetic field dose, then that pipe would act like a wire. Its field or expansion is 90 degrees from the pipe. Just like the magnetic field.

This field or pipe expands as the pressure increases. Less pressure the slower the expansion.

If we could pressurize higher it would expand faster. More voltage.

More voltage would help. We only need a small amount of current to build pressure. So a smaller pipe would expand faster with less flow.

And only one end of flow to make the pipe expand. Or "build the field." (on the pump side)

So there for if we restrict the flow with a small wire, we can increase the pressure faster, and the field or pipe will expand faster.

So more resistance is better in this case. Because it lowers the current or flow If we use more pressure voltage.

So if we have a small pipe. And the pressure is high, think about what happens when that pump stops abruptly, or if we had a very fast acting valve in the pipe. There would be a pressure wave in the pipe.

because the rapid change in waters velocity, There is a massive pressure surge that we see as a high voltage spike. Also known as a transient spike. Same thing as the water hammer. That's the "field collapses"

At this point we have had our high voltage spike. Or pressure wave. However all that pressure in the pipe wants to back out.

The flow or current also needs to come back out, and that takes time. Just a as it took time to build up the field. The more pressure the faster the field builds up.

So this means that there are 2 things happening. One is the pressure wave, we call this the transient voltage spike. , and the other is the flow we call BEMF.

Now think about if we had that pump pushing water in the pipe, the three would be force pushing back on the pump, * *(draw this on the board) this is called Counter EMF. Or CEMF. Also known as Back EMF or BEMF.

So the entire time the pump is running there is back EMF. Not just after we stop the pump or the flow in to the system.

However everything that went in must come back out. Because it's a closed ended pipe. And this takes time. But the rapid change in the waters velocity or direction is where our pressure wave comes from. Also known as the BEMF voltage spike.

This also means that the more times you turn on and off the pump, you create a surge every time.

So by turning on and off a coil rapidly you generate a spike every time, and sense we are using voltage or pressure, not current that spike is very big. This action also further restricts the current. As long as the field is changing its trying to restrict the flow or current.

** talk about anything I missed.

Let's talk about the water in an elastic pipe.

Think about what happens when we have a bunch of pipes in a coil. Also known as an inductor such as a wire in a coil, (***draw this on the board)

if those pipes were expanding like the magnetic field, then they push on each other as they expand. Adding to each other.

So the more pipes the better and the smaller the pipes the better because the less flow can get through the pipe the better. The more turns the bigger the field for the same flow or current, but the voltage can be increased to get more expansion of the pipes or field.

On the other hand if we have a few turns of a big pipe. (*** draw this on the board) Then we need more flow to expand the pipe the same amount. So for the same input flow or current we get less of a field, or less expansion of the pipe.

However, the water analogy only goes so far. So for the next parts they won't directly align with the rest of what I'm going to say in this video.

Because we are taught that the current generates the magnetic field, we use big wire and a lot of amps. But the truth is, you only need a small amount of current in even a big wire, only to align the atoms. After that we can use voltage to expand the field.

Because current is what we say dose the work most of the time,

However it's better to using voltage instead. It's more in the pure potential side of the equation. And it allows us to not kill our dipole as I have been saying. Or our source.

This is even a better explanation of an open ended coil.

Talking about Switch closure using long wire vs short wire. Time changes dramatically. How about in an inductor, does it help?

From on line source. http://www.electronics-tutorials.ws/inductor/inductance.html

Quote

Inductance, L is actually a measure of an inductors “resistance” to the change of the current flowing through the circuit and the larger is its value in Henries, the slower the rate of current change.

Quote

The more atoms aligned the more inductance it has. more turns.

Quote wiki.
In physics, the magnetomotive force is a quantity appearing in the equation for the magnetic flux in a magnetic circuit, sometimes known as Hopkinson's law. It is the property of certain substances or phenomena that give rise to magnetic fields:

$\mathcal{F} = NI$

where N is the number of turns in the coil and I is the electric current through the circuit. Sometimes the unit of gilbert is used to express $\mathcal{F}$.

Quote

So let's have a look at this.

According to my last video I stated what happens when we have a coil, with the same mass. And it had the same magnetic field.

I used 100lb of copper.

40awg, vs 18awg.

For the same wattage. We get:

100lb bare copper,
18awg, the coil is I = 109mm D=109mm W=102mm
Wire length is 6,205 meters
Resistance is 130 ohms,
100V
.769A or 769ma
77 watts
Turns = 9,024
The MMF or magneto motive force. Or Amp Turns That's turns x amps = 6,946 MMF.
Rough calculation of inductance. 22.5H

So to have the same MMF with 40awg, and the same 100lb bare copper, we have:

I= 109mm D=109mm W=152mm
Wire length is 1,049,543 meters
Resistance is 3,691,637 ohms,
16,700 volts
.0045A or 4.5ma
75.55 watts
Turns = 1,531,805

MMF = 6,929
Roughly calculating inductance is 647,312 H

So we have to put more power in to the coil to get the same amount of MMF for the same weight.

However our coil parameters changed.

Quote
As the inductance of a coil is due to the magnetic flux around it, the stronger the magnetic flux for a given value of current the greater will be the inductance. So a coil of many turns will have a higher inductance value than one of only a few turns and therefore, the equation above will give inductance L as being proportional to the number of turns squared (N2).

Quote
As well as increasing the number of coil turns, we can also increase inductance by increasing the coils diameter or making the core longer. In both cases more wire is required to construct the coil and therefore, more lines of force exists to produce the required back emf.

Quote

**Read.
So the more inductance the more Back EMF. However in our coil above, we use the same power, and the same amount of copper, and got a massive increase in inductance. So there for the same amount of input or EMF, We got a lot more BEMF... hummm...

Quote
If the inner core is made of some ferromagnetic material such as soft iron, cobalt or nickel, the inductance of the coil would greatly increase because

for the same amount of current flow the magnetic flux generated would be much stronger.

Quote

how about some magnets in the core??

What im about to say is in 100% correlation to current understanding.

and yet some people can't see it... there not going to agree with it.

Quote

Inductors are made from individual loops of wire combined to produce a coil and if the number of loops within the coil are increased, then for the same amount of current flowing through the coil, the magnetic flux will also increase.

Quote

now things get really interesting.
Let's look at a coil With a fixed Resistance of 10,000 ohms. So will fix the voltage and that will fix the amperage. As well as the Amperage.

1000V 10,000ohms, = .1A or 100ma thats 100W

Looking at resistance vs current

I =10mm, D= 10mm, W= 8.6mm

#44 wire.

10,000 ohms,

.048Lb of bare copper,

wire length is 1200 meters,

19,158 turns,

Amp / turns = 1,881 in magneto motive force MMF

Henry is 9.29

Note: from users comment, the math is slightly off, here are the real numbers: the real numbers for #44 are:
turns: 19,158
length: 1,206 meters
resistance: 10,184
mA: 98.18724
so the real numbers are slightly off, these are within the insulation fudge factor. and how well the wires is layed.

If we use the same amount of current in a 2AWG wire then the coil would be huge, but it's the same amount of current. Even the same amount of wattage.

Coil is I=12,000mm D= 13,000mm W=860mm

#2awg:

10,000 ohms.

12,916,845LB

Length is 119,372 meters!!

249,798 turns.

Amp / turns = 24,826 in magneto motive force

2,105,117 H

Let's do the reverse calculation.

Let's see how much power it will take to generate the same MMF with #2 wire when using amp / turns to calculate power required.

Amp / turns = 1,881 in magneto motive force in 10,000 ohms of #44, using 100watts. .048Lb of bare copper,

EDIT: these values were wrong, fixed below

To generate 1,881 MMF in #2 awg will take @ 1000V X 5,893 A

5,893,000 WATTS

Coil will be I=165mm , D= 165mm W= 86mm

0.17 ohms.

Wire length is 330 meters

Only 317 turns

217 Lb of copper.

.04H

Here are the wright ones:

To Generate 1881MMF in #2 awg we need 1V@5.893A

That's 5.89Watts.

Wire length is 330 meters

Only 317 turns

217 Lb of copper.

.04H

However, The all the facts still holds true, current is not what makes the magnetic field. it's only a catalyst I find it interesting that we can use 217lb of copper or .048lbs to get the same MMF... also the #44 coil has almost 10H, where the #2 only .04. and looking at the current: #44=100mA vs the #2=5.8A for the same MMF... so again, current does not fit the bill. All very interesting and also goes against what's currently thought...

What does all this mean?

I means if you can increase the H while decreasing the power input, you will generate more BEMF.

(Video text Insert) Insert:

What I'm trying to say is that the inductance plays a major roll to get the high voltage spikes / current spikes. Theses do NOT come from the BEMF. They come from the coil's rapid change in direction!!!! (like water hammer) Don't forget the BEMF is always there!! You only see the transient spikes (current and voltage) when you make rapid changes!!!

So if the input was a nice AC wave you will get the same BEMF as EMF. No questions asked.

Also no transients....

The voltage and current spike (transient) is a SECONDARY action!!!

For the SAME AMOUNT of INPUT... The MORE Inductance, the Faster the Change in Direction, the BIGGER the output transient..... Isolated from the BEMF..... The transient is "FREE".....

The more atoms you can align with the lowest amount of current. the more the BEMF will be.

When you have a coil that is that massive, it turns more in to a capacitor.

It also means that any heat generated is wasted.

When you heat something, you dissalighn the atoms, then you do this you have to put more to counter act that to get the same output. More alignment = more magnetic output.

But if you keep it cold you can push small amounts of power in to the coil and get a much bigger outcome with no losses. Up to 100% conversion.

This is where our electrical losses come from. Heat. We don't need much current to make a magnetic field. And the bigger the field the bigger the BEMF.

At some point you reach a critical mass so to speak. Where you can get more BEMF that the required EMF.

Added after the video:

let me put it this way, when you calculate Amp turns. you get these numbers I show in the video and this doc. However a better way to calculate it is Lb/turn. For the same amount of resistance, same amount of current, same amount of voltage, for the same watts, but increase the wire size to match the same resistance. we get the result I talk about. The real way to calculate it is Lb/Turns.... more copper, more magnetic alignment, same amount of input, bigger the field. Bigger the transient.

Im not here to prove anything, I'm only here to show you the facts. I will never prove anything to you. You have to convince yourself of the true.

11-22-17

God bless!

For we are freely given the knowledge.

So we should freely give the knowledge.

~Russ Gries

www.RWGresearch.com

http://open-source-energy.org/?topic=3128

See video for more details: https://youtu.be/FG9FLQHhY-A