Magnetic levitation and the Halbach Array explained mechanically

by Daniel Archer

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I came to this subject by watching the following youtube video by Veritasium: https://www.youtube.com/watch?v=pCON4zfMzjU&t=285s

Miles has already outed this guy as a rich kid and shameless toady for the mainstream. He does explain the setup of the Halbach Array but after that there is no mechanical explanation on how/why the levitation is possible. His explanation is this:

As the magnets spin they create a rotating magnetic field in the copper beneath them, this induces currents that create magnetic fields which oppose the field of the spinning magnets above. The result is a repulsive force that is effectively lift for this quadcopter.

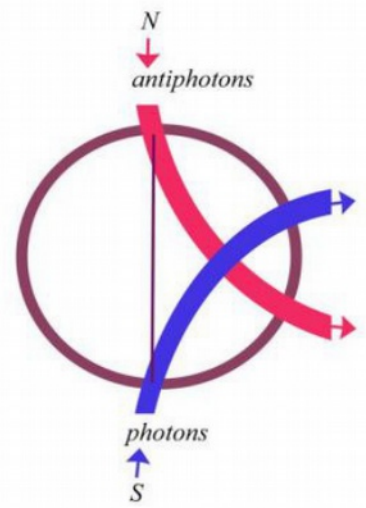
So you have “rotating magnetic fields” in the copper plate? What is a magnetic field physically? How can it rotate in the copper sheet? How does it induce current, what is current physically? How do these currents create magnetic fields and how do you know they oppose the spinning magnets above?

This “explanation” only raises more questions, it is not an answer; it is empty verbiage devoid of physics/mechanics.

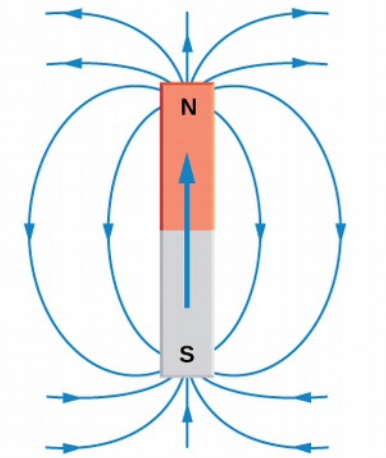
Luckily Miles has explained how magnetism works mechanically, see this paper: http://milesmathis.com/magnet.html

Magnets channel the charge field (ie real physical photons). They channel through their poles mostly. Magnets can do this better than other matter because the poles of the atomic nuclei are aligned and their physical structure favors a strong through charge (see Miles’s paper: http://milesmathis.com/per4.pdf). Since the photon field on earth is imbalanced (2/3 photons, 1/3 anti-photons), the charge coming in at the south pole is stronger/larger than the north pole, this makes the north pole stronger by default. Or said physically, there is more charge (photons) coming ***out*** of the north pole than the south pole. Also, the two charges streams meeting along the pole and spin one another up, adding to the magnetism (which is always a spin effect).

In the diagrams below you can see the normal charge recycling in normal matter (generally) on the left and the magnetic field lines in a bar magnet on the right. The field lines have little arrows, the arrow in the bar magnet points up to the North, indicating the strongest field potential. The magnetic field lines are not a field entity only, but indicate the real motion of charge (physical photons). Thus the arrow up to the north indicates the strongest charge direction. In Miles' figure, the arrows indicate current or E, not B.



Charge recycling, Miles Mathis

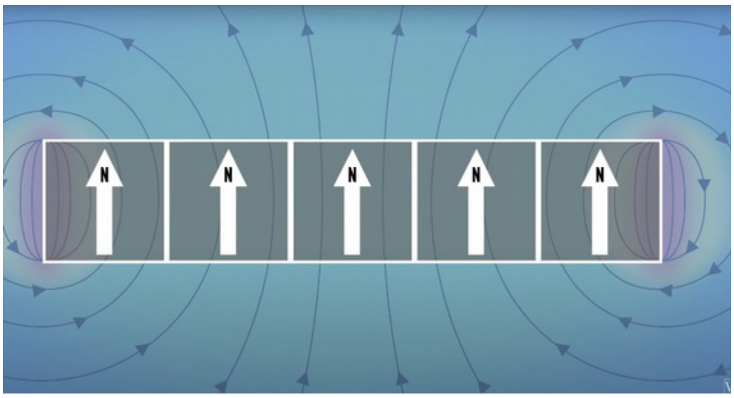


Magnetic field lines of a bar magnet

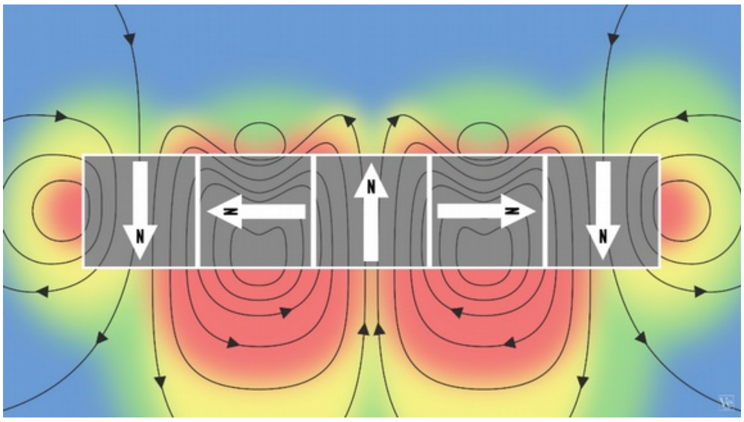
Before explaining the magnetic levitation I will first explain the Halbach Array. I checked Wikipedia but there is no physical explanation of how it works, just fluff about flux. And this quote from Google answers:

A Halbach array is a special arrangement of permanent magnets that augments the magnetic field on one side of the array while cancelling the field to near zero on the other side. This is achieved by having **a spatially rotating pattern of magnetization.**

I bolded the "explanation", but that sentence only means that they do not have all the magnets in one direction, they varied it…see below a normal array with all north poles pointing up (screenshot from the Veritasium video):



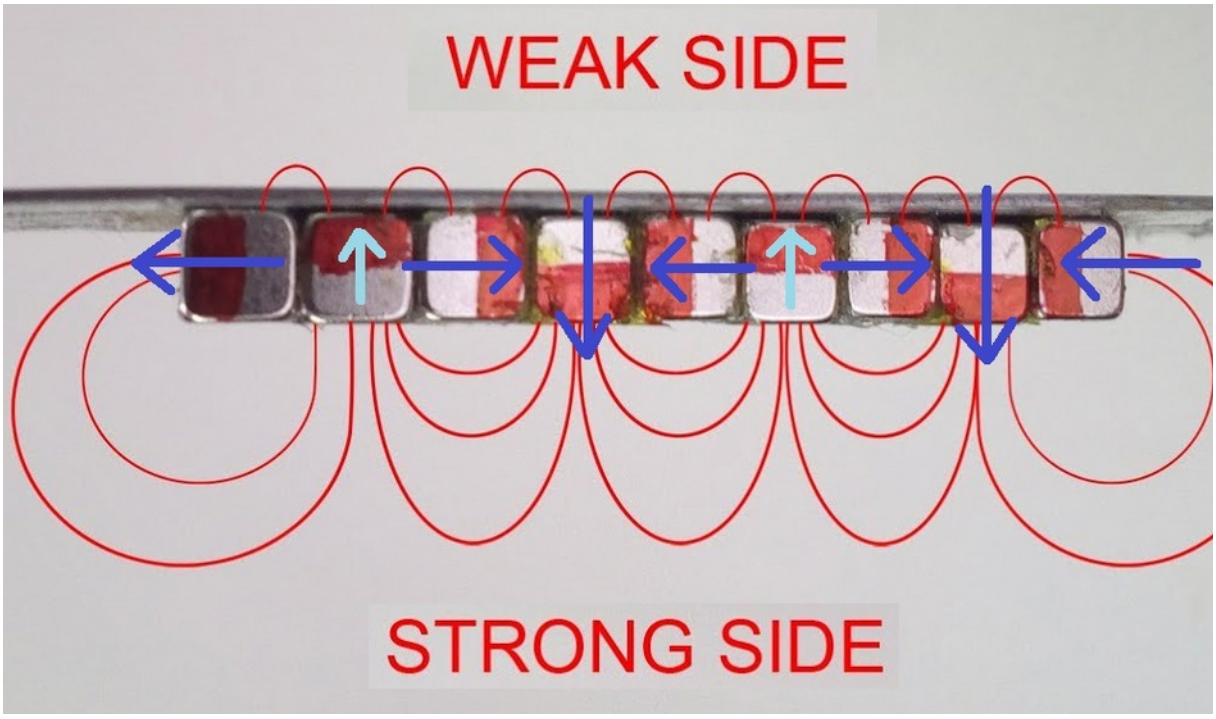
Next is the Halbach array (screenshot from the Veritasium video), you can see that the '***spatially rotating pattern of magnetization'*** just means they flipped some magnets on their side! It does not explain anything.



So how does this really work physically? You can see they drew in a lot of red below and almost no red above, the red means stronger magnetic field. But the internal arrows labelled N don't tell us why they would create those fields. Yes, we have two arrows pointing down and one pointing up, but that doesn't explain why the red tends to pool below sideways arrows, or why the arrow pointing up doesn't create a pool of red above it.

If we follow Miles Mathis's physical explanation of magnetism it just means there are more photons on the strong (red) side than on the weak side. In the above picture it almost looks as if they are trapped. But we can not rely on that picture, since the real charge (photon) distribution may look quite different.

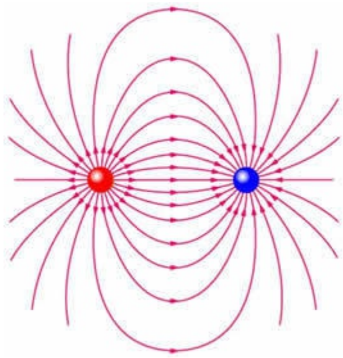
So to explain the Halbach array and how it really works I drew some arrows in another picture, see below:



The big blue arrows pointing down are drawn larger as they represent the strongest charge channeling, the light blue arrows pointing up represents the weakest charge channeling. But why? I think it is easy to see, from left to right you can see 2 blue arrows pointing away from the small light blue arrow, meaning; charge is channeled away from it. Going further left you can see 2 blue arrows pointing towards the big blue arrow, meaning charge is channeled towards it. The end result is more charge going down creating a strong side and less charge going up creating a weak side. That is it, a really simple and physical explanation; not found on Wikipedia or anywhere else (I really looked).

In conclusion, the Halbach array creates a strong charge density (more photons) on one side and a weak charge density (less photons) on the other side.

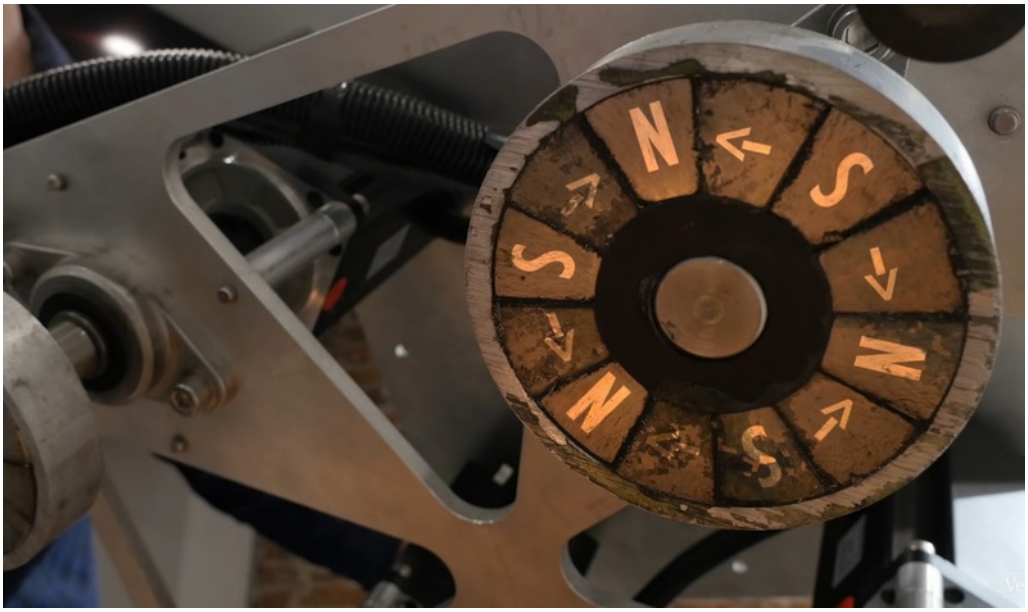
[Miles here: Daniel has the basic idea right, and his explanation does improve on the mainstream one, but you can see it can't be complete, since there are still unanswered questions. The first thing we notice is that the "magnetic field lines" around a magnet aren't really magnetic field lines. They are E lines, since they tell us the direction of charge current there. That is admitted here, which comes up first on a search for that. Although they are called magnetic field lines, they just happen to match the E field lines of opposite Electric charges.



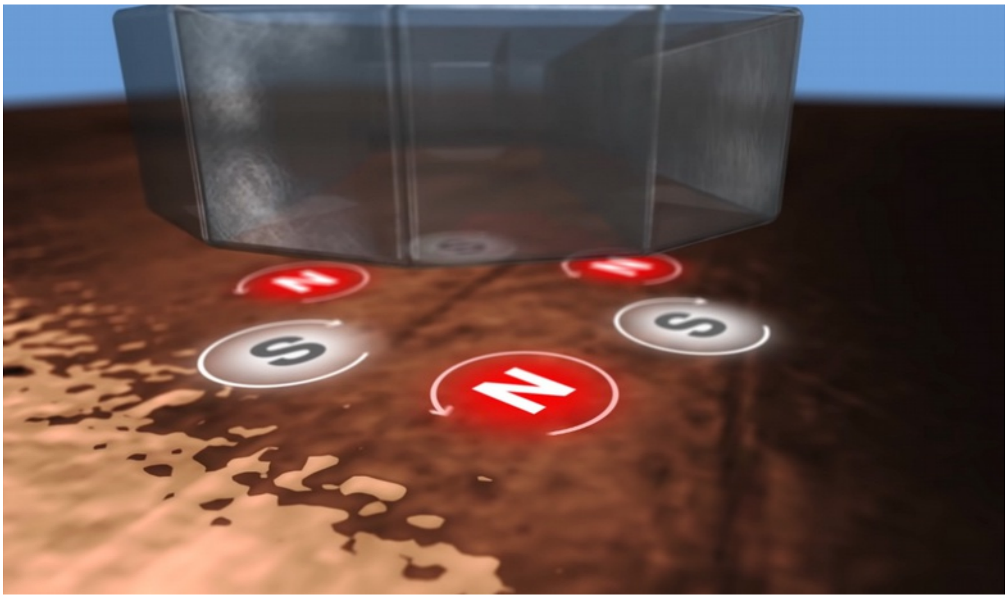
In other words, those vectors tell you how a photon would move linearly in such a field, not how it would spin, so the lines are E, not B. Therefore, they are not magnetic field lines, they are electric field lines around a magnet, which is not the same thing. To be useful from a theoretical point of view, magnetic field lines should tell us something different from E field lines, and they should tell us how the photons are spinning there. Are they spinning left or right? Mainstream diagrams of E and B fields have always been garbled and confusing, and that is because the mainstream still doesn't understand that all EM fields are based on fields of spinning photons. Those photons are always moving at c and spinning, so we need to know if they are moving left or right AND whether they are spinning left or right. BOTH. Since Daniel has ignored spin, he still hasn't really given us a magnetic analysis here. He has simply clarified the big arrows of the mainstream somewhat. We will look more at spin below.]

Now how does the magnetic levitation work using this Halbach array in the quadcopter, by spinning the array really fast?

First a picture of the setup:



Above you can see an Halbach Array in one leg of the quadcopter and then they start to spin the array:



…and showing the above graphic while the narrator gives the quote I provided at the beginning of this paper:

As the magnets spin they create a rotating magnetic field in the copper beneath them, this induces currents that create magnetic fields which oppose the field of the spinning magnets above. The result is a repulsive force that is effectively lift for this quadcopter. – comment: ugh

To explain this physically we have to know what the photons are doing, what is the difference in photon mechanics between a stationary Halbach array and a spinning one?

Generally both non-spinning and a spinning Halbach array have a higher photon density below but what does the spin of the array add or do mechanically?

The explanation Miles Mathis provided for lift on a wing will help: http://milesmathis.com/lift.pdf

With a wing the most important part to lift is speed, the airplane has to attain a certain velocity to hit more of the upcoming charge field; more hits is more lift. Quoting Miles from the lift paper: "*The faster you are moving sideways to the field, the more charge you feel*"

A similar situation is created by spinning the Halbach array but this time from top to bottom, ie the Halbach array spinning means **the photons are hitting the copper plate more and more**, thus the device is pushing itself up against the copper plate. The copper plate is (sort of) the wing in this case.

This increasing charge density between the plate and the Halbach array heats up the copper plate, the copper plate gets hot, proving once again that charge (photon density) is heat.

The charge field explanation for magnetic levitation is much simpler than the standard one.

simplicissima ratione solet optima

[Miles: Again, Daniel's analysis is left in a sort of halfway state here: he is not wrong, but he is not completely right, either. Since he is following my previous papers, he is on the right track, but not fully there. Let's bring spin into the analysis to show how it helps. As we know, magnetism is always a spin effect. If we are just following a linear or wind-type effect, we are always studying the E field. We are looking at photon current and therefore ion current. Ion current follows photon current. But if we claim to be looking at a magnetic effect, we have to study spin. We have to figure out which way our photons are spinning, and in what amounts.

As Daniel reminded you, charge enters both poles (of anything—nucleus, electron, ion, molecule, planet, star, galaxy), but here on Earth charge outnumbers anticharge by 2 to 1, so the south pole is stronger. It pulls in more photons. If we are looking at EM fields, then we know we are dealing with through charge at the nuclear level, so we are looking at charge that is moving pole-to-pole rather than pole-to-equator. Therefore, more charge will be coming out the north pole. Anticharge will be coming out the south pole, in a halved amount. But in these mainstream experiments, they focus on one charge or the other, normally the charge rather than the anticharge. Since charge is normally dominant, it will dominate and define the ambient field. So if you take a normal measurement, you will be measuring charge and ignoring anticharge. The anticharge is always there, it is just hidden by the stronger charge field.

Given that, we can see that both the mainstream and Daniel are ignoring anticharge. Their vectors are tracking the dominant charge field, so we are seeing where left-spinning photons are going here. As I said above, those vectors are actually E vectors, since they tell us the direction the photons are going, not what way they are spinning. But since they are tracking charge and not anticharge, we know without even looking that all charge is coherent here. It is being channeled through nuclei to start with, then filtered by our method, so all our tracked photons here are spinning the same way. To say it another way, all the photons being tracked by the drawn vectors are coherent. That is why they create a B field to start with: the spins match, so a field is created. If half were right and half left, the B field would be flat. There would be no B field, as on Venus. The spins would offset as a sum, and the field would sum to zero spin.

That explains why spin increases the effect. Daniel is not wrong: the spin of the array will also increase the E-field density, by creating more collisions in the same time, giving us a wing effect here. However, a greater part of the lift is caused by the B-field, not the E-field. Remember, I updated my lift paper to include that later, once I recognized it.

But I beg you to notice something important: it matters which way you spin this Halbach Array. As with any other magnetic effect, you get the maximum desired effect in only one setting. You have to match the macro spin to the micro-spin, to get the increase in lift. You are using the macro-spin to magnify the micro-spins, you see. In short, you are creating a field of photons moving down to array itself against the Earth's photons (and ions) moving up. But this effect isn't just wind effect, or E effect, it is also a B effect. So you need to spins to offset, creating a repulsion. So the spin of your array has to match the photon spins in the magnets, but counter the photon spins coming out of the Earth. This is normally not hard to achieve, since the array is sending photons down and Earth is sending them up: they are already reversed. So you don't have to create antiphotons either way. Or you do, but you do it just by reversing their direction. You don't have to use complex filters.

Now that you have that under your belt, we can go back to the first question: why does the array of magnets create a strong side, and how is that achieved? Already we can see that the mainstream diagram, with pools of red below the sideways magnets, is misleading. Even Daniel's correction is only a partial correction. Why? Because we don't care about those photons that are looping back close to the array. They aren't the cause of the effect here, so it is misleading to draw attention to them. Just the opposite: it is the photons moving most vertical here that are causing the effect. So it is Daniel's big blue arrows we should be focusing on. We want to maximize the density along that vector, while minimizing photons looping back sideways. In fact, both the mainstream diagram and Daniel's correction miss the fact that what we really want to do is capture ambient charge from above (the weak side), pulling it down through that big blue vector directly. In other words, these diagrams are diagramming the field created by the magnets, while ignoring the ambient field, or the field that is there before the magnets are inserted. This causes you to miss the fact that the given array acts to do just that: pull ambient charge down from above. The big blue vectors not only imply a release of charge down, they imply a capture of charge above. The vectors have *two* ends, don't they? But given the current diagrams, you completely miss that. Because of the way the small vectors are looped back on top, you forget that this array would pull charge strongly from the ambient field above.

Once that pull is achieved, the main charge channels are defined by that, not by the internal channels. The ambient field on the Earth is very powerful, and charge coming down is a large fraction of charge coming up, as we know. Part of that is sunlight. But that is always forgotten in these mainstream diagrams. They diagram charge channeled by the magnets, but ignore the ambient field entirely. That is upside down, because the ambient field is far more powerful than the internal field of these magnets, and the former of course causes and determines the latter.

So the given array actually does exactly what I said needs to be done: it pushes the photons into increasing vertical densities, and partially short-circuits those horizontal loops. The other thing that does that is that the array is then closed in a circle, rather than being a linear array. So there is no input to the array from the sides. There are no sides in a circle, so again the channels are forced to pull in ambient charge from above, further enriching those big blue vectors pointing down.

I hope you can see why this is a necessary first step, before we start spinning the array. We need a high density of photons moving straight down, to collide with the Earth's field moving straight up. And we need them moving as near straight down as possible, to get the spin of those photons in the correct plane. The photons moving sideways in those red pools in the mainstream diagram are no use to us here, since they are spinning in the wrong plane. Plus, as you see, some are moving left and some moving right, so they can't sum. Even if they were in the right plane, they would sum to zero and be magnetically flat. Spinning the array would have little effect on them in the second step. Only photons moving straight down can sum and give us spins in the right plane. If we match the spin of the array to that spin, we can multiply it. If we then collide that spin with an opposing spin, we create a repulsion, by simple mechanics.

If opposing spins (photon and antiphoton) meet from opposite directions, they are opposite twice, and so are the same. They spin one another up and create an attraction. This is what happens along the nuclear pole. If same spins (photon and photon) meet from opposite directions, they are opposite once, so they spin one another down and create a repulsion. If you think of them as cogs, they don't match, they catch, and force one another apart.

Remember that, because it tells you that any repulsion implies a real loss of local spin. There is no conservation of spin energy. Our repulsion is linear, so we have an increase in linear energy. Energy has transferred from spin energy to linear. Total energy is conserved, but not spin energy. But how can this transfer from spin to linear occur? We have already hit that, and it is obvious regardless: it happens on the tangent. Photon hits are edge hits, and they occur at a tangent.