The EMC Effect

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A reader pointed out to me that this EMC effect is another obvious confirmation of my nuclear models. EMC stands for European Muon Collaboration, which was a series of experiments at CERN in 1983. These experiments were set up to study muon collisions, as the name implies, but they ended up discovering something far more important about nuclear structure. It was found that the nucleus acted far larger or more powerful than would be expected by adding up the nucleons in it. Wikipedia admits:

While over 1000 scientific papers have been written on the topic and numerous hypotheses have been proposed, no definitive explanation for the cause of the effect has been confirmed.[2] Determining the origin of the EMC effect is one of the major unsolved problems in the field of nuclear physics.

It's *not* unsolved, since I solved it long ago. But since they have been pretending I don't exist for twenty years, they have to pretend not to know it has been solved.

Most of the mainstream proposals try to explain it with quark energies, since nucleons are thought to be made of quarks. But of course we have never had the least evidence quarks exist and tons of evidence they don't. The only reason they are thought to exist is because Zweig and Gell-Mann proposed a now-famous model with cutesy names decades ago and promoted it to the hilt. But as I have shown in many papers, that promotion was all the theory had going for it. Otherwise it was just a poor flight of fancy, like all other new "physics". I put physics in quotes because the theory isn't even physical, having to borrow from the vacuum and propose a slew of other particles we have zero evidence for. In 57 years, no one has ever seen the least evidence of a quark in a lab or experiment, and although they are always inferred, the inference is always pushed mightily. I have proved that by instead inferring the charge field in each experiment, the data is always explained much more quickly, cleanly, and thoroughly. In fact, ALL the evidence gathered over the past 57 years has pointed at my charge field, and none has pointed logically at quarks.

As just one example, the DIS (deep inelastic scattering experiments) starting in the late 1960s showed internal structure to the proton and neutron, but they never indicated quarks. What they indicated was that—like all other particles—the nucleon is made up of orthogonal stacked spins. At the right angles, internal spins could be hit, which confirmed internal structure. But rather than assign that momentum to the angular momentum of the internal spin, these old "physicists" needed to assign it to their own model, which just happened to be sitting there on the table. To do that required an unsightly compendium of pushes and fudges, none of them the least bit rational, but that didn't stop anyone. They fit the model after the fact to the data, as usual, so it had no predictive ability. And they pretended not to notice that the Bjorken-x momenta, all being functions of the same variable, immediately falsified the quark model. Why? Because there is no reason these quarks should be functions of the same variable; but if this internal structure is stacked spins, it is explained why they are functions of one another. To say it another way, it has never been explained why the different quark flavors are what they are. What determines the architecture? It all looks like an arbitrary mishmash. But with my quantum spin equation, we can very simply calculate the different levels, and see how each one relates to the others, both as math and architecture.

Even after I did this math for them, they preferred to ignore me, keeping the quark model only because it had already entered a million textbooks. It is dogma, and cannot be replaced no matter how awful it looks next to the correct theory. But keeping quark theory after my arrival is like continuing to practice trepanation after brain surgery had been invented.

Another way the EMC effect falsifies quark theory is in the fact that it increases with the size of the nucleus. If this was something to do with quarks, it wouldn't increase with larger nuclei, since the quarks in larger nuclei are not larger. Another clue in the same direction is the fact that the effect scales with local nuclear density, not average nuclear density. That again points to this being a charge effect, since I have shown why charge is always a local effect. In other words, charge density varies widely in the same nucleus, depending on where you measure it. And that is because charge is being channeled through the nucleus. In the same nucleus, not all nucleons are channeling the same. Depending on its position in the nucleus, a nucleon can be channeling more or less. Since there is no charge channeling in the quark model, it cannot possibly explain this data in a sensible way.

The other nail in this coffin is the sheer size of the miss. Nuclear binding energies are almost a thousand times too small to explain the GeV energies in DIS. Once again, ignoring the real charge field (Maxwell's displacement or D field) has been a disaster for particle physics from the beginning. Without a real charge field here with real energy, there is simply no way to explain this huge miss. What does begin to explain it is the calculated size of the charge field, which I have shown many times is 19 times the matter field. Charge isn't just a puny river running through the nucleus, it is 95% of the energy of the field. Even that doesn't explain the big theoretical miss here, but it gets us started. To explain the miss of many hundred times requires we redo all the math at the nuclear level, and I have already done a lot of it. For one thing, we have to rework the whole idea of binding energies, which is also skewed by ignorance of the charge field. All binding is done by the charge field as well, so all numbers here are a function of the same charge field.

To see the pathetic state of mainstream theory on this, you have to take a close look at the theories to explain EMC. Many of the top candidates like Fermi motion and nuclear pions have been ruled out in succeeding decades by things like electron scattering and Drell-Yan scattering. But the first mentioned by Wikipedia is the mean-field model, which proposes that protons and neutrons in the nucleus aren't really protons and neutrons. Close packing may allow quarks to interact across nucleons, in effect creating a quark soup. How this would explain an increase in energy of several hundred times is never revealed, since even if quarks could cross-pollinate like this, there were a limited number to start with. Cross-linking cannot possibly explain such a large increase, except by assuming quarks can somehow boost their total energies at will, I guess by sucking it out of the vacuum. According to mainstream theory, particles have native energies based on their masses, so they shouldn't be able to drastically increase those energies simply by cross-linking. So this is another theory by fiat. The energy is needed, so the magical particles provide it, without a rational explanation.

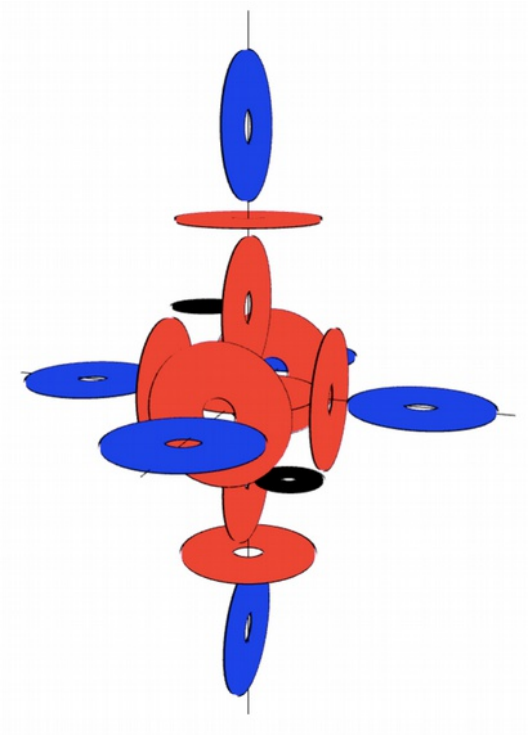
We are told this mean-field model scales to local density, but again it only does so by fiat. Since larger elements don't have larger quarks, this model can scale to data only by giving larger elements more cross-links and more magical energy boosting.

As you can see, all this data is far easier to fit to my model, which explains it logically. Larger nuclei are channeling more charge, so of course they will show a greater EMC effect. Charge naturally gives us the extra degree of freedom we need here, and the extra multiplication factor.

The short-range correlations theory is just a nudge of the mean-field theory, and falls with it.

Wikipedia admits none of the other theories are even worth mentioning, so I won't bother critiquing them.

In contrast to these very poor theories, let us compare my charge channeling/nuclear architecture theory. Since my nucleus is not just a close-packed bag of marbles, it already has a greater size, and therefore a greater possible angular momentum. Being in the shape of an elongated octahedron, the nucleus is capable of spinning on its axis, creating what I call a carousel level at its equator.



This spin will give each nucleon a spin component as well, above and beyond any local spins it has. And so, in a greater charge field, not only will this nucleus channel more charge through its interior architecture, it will spin faster as a whole. Why? Because not all ambient charge can be channeled. A given nucleus can only channel a given amount of charge, so the residual charge will beat on the exterior of the nucleus, spinning it up. This gives us yet another degree of freedom the standard model and quark model does not have, and another multiplication factor for our math here.

So you can already see that the quark model is lacking not only the idea of channeled charge, it is lacking the idea of nuclear architecture. Even in the most advanced mainstream EMC theory on the table, that of short-range correlations, there is no idea of nuclear architecture—meaning an overall structural plan for maximizing field energy. My nuclear model is light years more advanced than anything the mainstream has ever been able to come up with. All you have to do is read my paper to see that I had already fully solved this EMC problem ten years ago. Given a real charge field of real photons channeling not only through every nucleus but every nucleon and electron, this EMC data is no longer anomalous. In fact, it is expected. We would only be surprised if the energy of DIS *weren't* hundreds of times the old naive binding energies.

Jefferson Lab has been working on this problem for years, but they haven't made any theoretical progress on it. You can see why by studying their page, which comes up number two on a Duck search for this topic. Here is the first sentence there:

Protons and neutrons are complex bound states of quarks and gluons, held together by the strong interactions of quantum chromo dynamics (QCD).

So they are admitting that is their first assumption. They aren't allowed to question whether or not that is true, and so are forced to subsume any new theory under that framework. But I have shown that is exactly what is impeding progress here, and in all similar channels. The fundamental model is wrong, so nothing can be built on it and no new data can be logically contained. If the fundamental model were right, you would be able to fit all new data to it immediately, as we see with my model. That is how you should judge a model of course. But that never occurs to new theorists, who aren't free to question anything. Murray Gell-Mann, being who he was, had to be permanently enshrined, and so if you are in the mainstream you can do nothing but assume he was right about everything and try to go from there. Which means you can go nowhere.

But I have shown you that with my models, both old data and new data can be explained with very little effort. Even questions that seemed to have no answers, and so weren't even asked, turn out to have simple mechanical answers. Such as why Technetium is radioactive, why Mercury is a liquid, and why the Lanthanides act reverse to expectations.

A 2015 paper by Wang and Chen is also highly listed on the internet, being available for free from ScienceDirect. It again tells us why no progress is being made on this question. Paragraph four of the introduction is this:

As we know, protons and neutrons inside nuclei are bound together with nuclear force. In Quantum Chromodynamics (QCD) theory level, the powerful attractive nuclear force comes from the residual strong interaction of quarks, which resembles the Van der Waals force between molecules. The emergence of nuclear force from QCD theory is a complex phenomenon and depends on the distances being considered. Nonetheless, calculations of interactions among nucleons are starting to be realized from Lattice QCD [12], [13], [14]. The nuclear medium modifies the quark distributions of a nucleon. A related fundamental question is whether the nuclear force plays an important role in the EMC effect.

Doesn't give you much confidence these guys know what they are talking about, does it? QCD has been around almost 60 years, but Lattice QCD is just now "starting to realize" calculations on nucleon interactions? Also, as I have shown, nucleons are NOT bound together with the nuclear or strong force. Like QCD, that is another barebones theory that has never been proven, and in fact has been disproven by many experiments of the past half century. The strong force has never progressed past the point of a suggestion, and the entire theory is among the most tenuous in all of physics. It would have to be, since it is based on nothing. The nucleus is held together not by some illogical strong force, but by its competing charge channels, which come in from both the north and south poles and cross along the axis. Also by ambient charge holding the nucleus together from the outside. But since the mainstream still knows nothing about charge channeling or nuclear architecture, it is forced to promote this idea that the strong force is a result of the interaction of quarks, selling it as an analogue of the Van der Waals force between molecules! That's pretty rich, seeing they also don't have any idea what creates Van der Waals forces. So this is just using the unknown to explain the unknown—*ignotum per ignotius*. They have always explained Van de Waals forces with induced dipoles, which is the usual fudge they use in the absence of a real charge field. See here where I destroy everything to do with Van der Waals forces, replacing them with the real charge field.

Anyway, you should laugh at this 2015 report at ScienceDirect, since it is pathetic to see physicists still

having to mention Van der Waals forces half a century after QCD was invented. If QCD had any worth at all, it would have given us an insight into these forces far beyond that of Van der Waals forces or induced dipoles. So to mention QCD and immediately have to fall back on induced dipoles is absurd. These physicists should be embarrassed to do it.

And although Wikipedia already admitted Fermi motion and pion excess had been disproved, we see that physicists are still using them to explain EMC. As is so often the case, when no single bad model is able to explain data, modern physicists have nothing to do but try to stack all the failed models in a pile. So Wang and Chen stack nuclear shadowing, Fermi motion, pion excess, and off-shell corrections. Really sad. Shameless even. This does not bode well for the rest of the paper, which we find is equally empty. In the summary we are told the EMC is linearly correlated to the binding energy, but we already knew that. The problem is the *size* of EMC, not whether it is correlated. Of course it is correlated, since both energies are coming from the same elements. But no hint about why the EMC is so much larger than expectation, 32 years after the discovery.

Another thing this paper of Wang and Chen shows us is that the mainstream is still subtracting out the Coulomb force among protons in the nucleus. They would have to, right, because they still think protons are repelling one another there. The strong force is thought to have to overcome that repulsion. But as I have shown, that is completely unnecessary. This is yet another correction to the math we can make using my model. In normal circumstance, protons do repel one another, but the mainstream doesn't understand how or why. It is still stuck in the time of Ben Franklin, where this was explained as same charges. The protons are both +, so they repel. Beyond that, the mainstream still doesn't understand how charge works, or even what it is. Current theory has "improved" on Franklin by suggesting this repulsion is mediated by messenger photons, which "tell" the particles to move apart. No, really. I am not making that up. That is currently state of the art. But I have shown you the answer is that protons, like every other particles, are recycling charge. Real photons are moving right through the proton in a defined channel: pole to equator, just like the Earth. When we bring two of these protons together, it is their charge streams that are pushing them apart, by classical mechanics. It works just like wind or water. The only way protons could avoid repulsion is by aligning pole to equator, plug to socket. But in a free state, they can't do that, because the ambient charge field doesn't allow it. The ambient field has already aligned them pole to pole, so the charge being emitted at their equators will create repulsion. It is quite simple, as you see.

But if we go inside the nucleus, that isn't true anymore. Inside the nucleus, the field is determined not by the ambient field, but by the internal field. In other words, the architecture of the nucleus has forced the protons to align pole to equator, like I just said. In that configuration, they not only channel the incoming charge, the repulsion is turned off. The repulsion was caused equator-to-equator, but that configuration is gone.

You will say, "How does the nucleus 'force' this configuration pole-to-equator, when the ambient field doesn't?" Because the nucleus was created in a star or galactic core, where the ambient field was much different and much much stronger. The pressure of that field was able to turn the protons, locking them into this permanent configuration which channeled charge. Once locked in, the channels cannot be broken except by another very strong field. Here on Earth, that happens only under very specific circumstances, and we have studied those in previous papers. We need not address them here.

Just so you know, this paper hit #4 at Bing and Duck soon after publication on the search "EMC effect". It is unlisted by Google or Ecosia.