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Despite Headlines, the EM Drive Is Still Bullshit

by Steven Novella

*Headlines declare, “To the Moon in Four Hours,” and “Star Trek Impulse Drive,” even from mainstream outlets like the Telegraph. This is an old story that will likely rear its head for years to come. It’s the free energy of space travel.*

Steven, none of the scientists who have been researching electromagnetic drive can definitively explain how it works, so your statement that "It's the free energy of space travel" is based on what? Can you provide any quotes from the scientists, which indicate that "free energy" is involved?

*The allure is simply too great for the cranks to ignore.*

Steven, the allure is also too great for scientists from around the world to ignore; including China, the U.K., and the U.S. (NASA).

*The makers of the drive claim that it produces thrust without propellant. Physicists say that such a thing would violate the law of conservation of momemntum [SIC]. Devices that claim to break a well-established law of physics have a terrible track record.*

Steven, the designers of the device did not claim that it broke a well-established law of physics; the device's critics claimed that it broke a well-established law of physics.

The designers disputed that.

*The device is alleged to work by bouncing microwaves back and forth within its chamber.*

Steven, no one has yet been able to satisfactorily explain the mechanism behind the device's successful experiments.

In this short video, the inventor Roger Shawyer, tries to explain how he believes his device works:

<http://nextbigfuture.com/2015/08/emdrive-paper-and-what-original.html>

*There is a subtle asymmetry to this, bouncing harder in one direction than the other, which produces thrust. The problem with this, of course, is that the thrust is not balanced by anything, you get net momentum in one direction without an equal and opposite momentum in the other. Newton is displeased.*

Steven, Newton wasn't all that happy with Einstein either ...

as I recall.

*Prior tests have been unconvincing, producing tiny amount of anomalous thrust that can easily be explained by experimental error.*

Steven, NASA doesn't seem to agree with your statement:

<http://www.nasaspaceflight.com/2015/04/evaluating-nasas-futuristic-em-drive/>

*The EM drive is back in the headlines with the typical hyperbole because of a new study looking at the drive. Although not yet published, peer-reviewed, or even presented, the details of the study are made available here: Direct Thrust Measurements of an EMDrive and Evaluation of Possible Side-Effects.*

*Perhaps one reason the study is getting so much media attention is because the authors, Martin Tajmar and G. Fiedler, are mainstream scientists with reasonable credentials. The only thing that matters, however is [SIC] the details of the study itself.*

Steven, as you yourself just admitted, these are not evolution-deniers or climate-deniers, but reputable scientists; so I am not sure why you are attacking scientists for doing what scientists do: science.

But it is true that what matters is the study itself; so what is it about this study that has you fiddling with your stethoscope?

*The study is an attempt to replicate a previous study showing a small amount of anomalous thrust. The authors conclude:*

*“Our test campaign can not confirm or refute the claims of the EMDrive but intends to independently assess possible side-effects in the measurements methods used so far. Nevertheless, we do observe thrusts close to the actual predictions after eliminating many possible error sources that should warrant further investigation into the phenomena.”*

*That statement should give any skeptical reader pause. The study results cannot confirm that the device works.*

Steven, what gives this skeptical reader (me) pause, is that you quoted the authors as saying that the study cannot confirm or refute the claims of EM drive, but then you paraphrased their conclusion ... and left out the "refute" part.

Was that an accident?

I ask because I've noticed that when Creationists paraphrase scientists they do the same thing: the paraphrase is never the same as the actual quote, and it always leaves out an important part that alters the meaning ... very much like what you just did.

Steven, I'm not accusing you of being a Creationist ... only of using their tactics.

*However they did record anomalous thrust. The question is, however, where is the thrust coming from, and the study cannot tell us.*

Steven, the study was not designed to answer that question and the researchers stated that fact at the beginning of their paper. The researchers stated that the study was designed to replicate thrust measurements (which it did) and assess measurement side-effects (which they did). They never claimed to be making an attempt to determine where the thrust was coming from.

*One likely source is that it is coming from heat, which is a known source of fake thrust measured in such experiments. Eric W. Davis, a Senior Research Physicist at the Institute for Advanced Studies at Austin, notes:*

*“I noted in [the study’s] conclusion paragraphs that [Tajmar’s] apparatus was producing hundreds of micro-Newtons of thrust when it got very hot and that his measuring instrumentation is not very accurate when the apparatus becomes hot. He also stated that he was still recording thrust signals even after the electrical power was turned off which is a huge key clue that his thrust measurements are all systematic artifact false positive thrust signals.”*

Steven, maybe you should forward to Eric Davis, that link I provided earlier. If you do, make sure to highlight this excerpt:

"*NASA Eagleworks has now nullified the prevailing hypothesis that thrust measurements were due to thermal convection.*"

*In other words, the measured thrust came and went with the heat, not with the power to the device. This is a huge red flag that the measured thrust was a side effect of heat, and not being produced by the EM drive.*

*In other words – it’s crap.*

Steven, that was a pretty impressive conclusion: "it's crap"; especially in light of this excerpt from the link that stated:

"*Despite considerable effort within the NASASpaceflight.com forum to dismiss the reported thrust as an artifact, the EM Drive results have yet to be falsified.*"

Steven, anyone would have to be impressed that a neurologist could overrule all the efforts of actual physicists who tried to falsify the results - but failed. You should email all of them with your conclusion "it's crap." I can't even imagine how grateful the worldwide physics community will be when they realize just how much time and money you've just saved them.

*Scientists generally are not taking the claims seriously,*

Steven, where is your supporting evidence for that assertion? Do you have a poll you can link to? Or a list of physicists besides that one guy, Davis?

*and not because they are closed-minded, or because they are shills for Big Propellant. They are skeptical because we have very weak evidence attempting to overturn a rock solid law of physics.*

Steven, according to the designers, their device does not overturn a rock solid law of physics. On that issue, the jury is still out, yet you have already sentenced the defendants. It might be wiser to exercise patience in a case such as this one.

*Again – history has not been kind to such claims.*

Steven, history was not kind to the claims of a heliocentric solar system ... and we all know how that turned out.

*I also note that the experiment measured very tiny thrust, in micro-Newtons.*

Steven, read the intent of the study. Then reread this excerpt from the link I provided you:

"*After consistent reports of thrust measurements from EM Drive experiments in the US, UK, and China – at thrust levels several thousand times in excess of a photon rocket, and now under hard vacuum conditions – the question of where the thrust is coming from deserves serious inquiry.*"

*This is a common pattern we see with free energy devices or cold fusion. They create tiny amounts of anomalous energy, in amounts that can easily be due to very subtle systematic flaws in the experimental setup. The proponents then claim that the effect can be scaled up – but that is the rub. We then never hear about a scaled up success, because the subtle errors don’t scale up.*

*The same is likely true here. I will be impressed when they develop an EM drive that produces actual Newtons of thrust – and [SIC] effect so large that a subtle error cannot be the explanation. Start flying ships around the solar system without propellant, and I will consider the possibility we need to rewrite the physics textbooks.*

Steven, don't worry about the textbooks. By the time the Texas Board of Education is finished rewriting the physics textbooks, most students will accept that snakes can talk, that the sun froze in the sky for one day, and that a non-union carpenter once water-skied on a lake ... without a boat.

*Conclusion*

*The new study does not confirm that the EM drive works.*

Steven, as stated earlier: that wasn't the purpose of the study. They clearly stated their intent in the link you provided.

*It simply replicates a previously flawed experiment and shows the same flaws.*

Steven, on what grounds do you declare the previous experiment flawed? Do you have any support for that assertion? And if it were known to be a flawed experiment why were these scientists investing all this time, effort, and expense into replicating it?

*The results strongly suggest a heat effect, not true thrust. Scientists remain correctly skeptical toward the claims.*

Steven, remaining skeptical toward the claim is fine; declaring it "bullshit" and "crap" ... is not.

<http://theness.com/neurologicablog/index.php/despite-headlines-the-em-drive-is-still-bullshit/>