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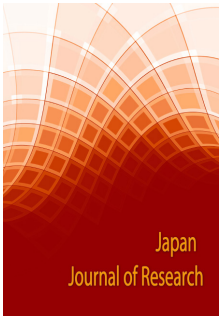

Review of Fractal Cone Laser Confinement and de Broglie Wave Articles with New Proof and Proposed Tests on Creating Gravity and Gravitational Waves

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Abstract

The purpose of this paper is to review and combine my prior published articles to present new proofs, conclusions, and to propose astronomical tests to confirm these proofs. This review of a combination of my prior articles about the fundamental nature of strength, matter, energy waves, and how the strength-per-weight ratio of fractal tube structures may be maximized by creating highly-focused fractal cone laser beam structures to contain and manipulate antimatter yields novel conclusions on gravitational waves and a way to create gravity. It is proven logically that gravitational waves have no upper speed limit and have acceleration. This opens new fields of research and gravitational wave communication engineering to enhance our understanding of the nature of matter, de Broglie waves, light, gravity, and gravitational waves. Novel means are proposed to detect gravitational waves from distant quasars and from objects beyond our observable universe, which may enlarge the radius of our observable universe.

Background

My Fractal Tube Reinforcement patented inventions and research contributions integrate fractal principals to open a new field, Fractal Tube Microengineering, emphasizing versatility and efficiency [1-4]. My patents disclose fractal tube prototypes that I have built and tested. I found, strength-per-weight ratio increases up to 10,336 (± 240) with increasing complexity of order for those made of paper [1]. In my SAMPE conference publication I explained that strength comes from order, and that if order is preserved and as much mass as possible is eliminated from a structure, then a minimum of its strength would be required to overcome its own weight, and a maximum of its strength would be available to carry load and resist forces [1]. This paper explains why this is true from large scales down to atomic scales [1]. Ongoing research is exploring potential applications in advanced materials and nanotechnology, such as biomedical devices to enhance drug delivery, tissue engineering, and in photonic devices to improve light manipulation. Fractal devices provide extra surface area for chemical reactions and interactions, and they can be scaled down effectively to atomic levels to maximize their strength-per-weight ratios.

I found, strength-to-weight ratio increases with increasing ordering complexity, and if a fractal array of highly focused laser beams were the components of a structure made only of light, then it would have a maximum strength-to-weight ratio. I invented and disclosed drawings of 2 embodiments of special vacuum chambers in which fractal laser cone structures all focused at one point could confine and manipulate antimatter by confining the light, by polarization, and by radiation pressure [5]. This invention was applied to invent a way to manufacture continuous microfiber with highly-focused laser beams in a vacuum chamber, as disclosed in our published and allowed US patent application [4]. Methods were also proposed to generate modulated gravitational waves and to amplify them by increasing the densities of matter and antimatter particle beams and by manipulating an amplitude and/or frequency of their implosions [5].

In my paper proposing novel double slit collision experiments I explained that after particles pass through a double slit, they de-localize into de Broglie waves and re-localize and re-materialize into a particles again, upon hitting a detector [6]. I disclosed my invention of a double slit vacuum chamber that would allow living bacterial spores to be passed through a double slit to be transmitted through a vacuum,

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as de Broglie waves, and to be localized or re-materialized at a detection screen made of an appropriate nutrient gel, on which they would grow and form colonies, again [6]. This opens a new field of research, Quantum Biophysics, to study the nature and behavior of de Broglie waves of living cells. Collisions of antimatter with matter in their de Broglie wave states in this device were also proposed [6].

Proof and Proposed Astronomical Tests

Since gravitational fields regenerate with particles having mass, upon localization of de Broglie waves on a detection screen [6], and since de Broglie waves are energy waves, like light, it follows that localization, confinement, and restriction from propagation of all types of energy waves, including light, must warp the spacetime continuum to generate gravity, according to the General Theory of Relativity. Therefore, the confined fractal array of laser light inside my internally-reflective, spherical vacuum chamber proposed to confine and manipulate antimatter disclosed in my prior paper [5], and presented here, as a smaller and simpler embodiment of this invention, would also generate gravity (Figure 1). Since gravitational waves are defined as propagating perturbations in the curvature of the spacetime continuum or propagating expansions and contractions of all 4 dimensions of spacetime, and since there is no upper limit to the recession velocities of galaxies or apparent expansion of the universe of about 73 km/second/megaparsec, this proves that gravitational waves also cannot have any upper speed limit. Since the above recession of galaxies or apparent expansion of spacetime has been found to have an acceleration of about 10^{-13} km/second^2/megaparsec, this proves that gravitational waves by the above definition must also have this acceleration. This proves that it is not possible for gravitational waves to have a fixed velocity equal to the speed of light, as is currently widely believed.

A way to detect gravitational waves is proposed by astronomically measuring vibrations in the exact position of objects near a gravitational wave source, where the amplitude of gravitational waves would be billions of times greater than that measurable on Earth, which is billions of lightyears away from such a source. Another way to detect gravitational waves is proposed by detecting contractions and dilations in the pulse-rate of pulsars that may exist near a gravitational wave source. These 2 ways could be used to directly identify locations of sources of gravitational waves detected by Laser Interferometry Gravitational Wave Observatories (LIGO), and to confirm or reject those wave sources identified by LIGO. These means are proposed to experimentally confirm the above proof that gravitational waves have acceleration and may travel faster than the speed of light. These means are proposed to detect gravitational waves generated by quasars, which are far too distant for their gravitational waves to be strong enough to be detected on Earth. These means may also be used to detect oscillations in the location of quasars that lie near the outer limits of our observable universe, caused by large gravitational waves originating from objects the lie beyond the radius of our present observable universe.

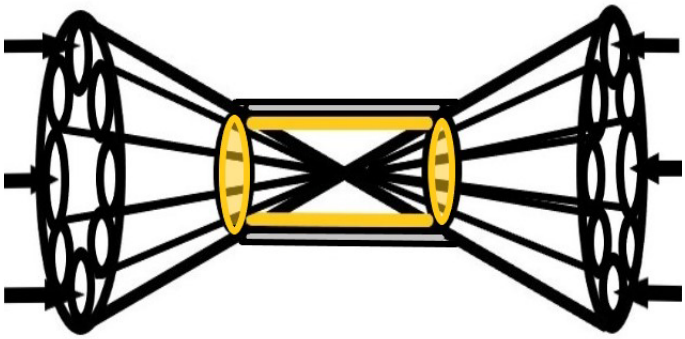

Figure 1. *Smaller and simpler embodiment of the invention shown in my prior paper [5] of a fractal laser vacuum chamber to confine antimatter and to manipulate colliding matter and antimatter particle beams to create and amplify modulated gravitational waves. The arrows and cones indicate 2 fractal arrays of laser beams all focused to a common focal point in the center of a cylindrical, internally-reflective, vacuum chamber shown in gold. Encapsulating shielding layers are shown in gray. A complete detailed description of how this works is provided in my prior article [5].*

Conclusion

The above logical proofs that gravitational waves have no upper speed limit and have acceleration would seem to contradict the speed-of-light limit on a speed of things travelling. However, there is no contradiction, because it is well-known that there is no speed limit on the expansion of spacetime, and gravitational waves are propagating expansions and contractions in all 4 dimensions of space and time or propagating perturbations of spacetime, itself. The fact that the apparent expansion of spacetime has an acceleration is consistent with a super-massive gravitational vortex into which the universe is falling, the source of which is beyond the limits of the observable universe. Indirect measurements of the speed of gravitational waves travelling over the Earth at about the speed of light by LIGO indicate that the speed of light is the lower limit of the speed of gravitational waves. The above proposed means of detecting gravitational waves originating from objects that lie beyond our present observable universe would serve to enlarge the radius of our observable universe.

In future, it would be interesting to develop means to measure the gravitational field generated by confinement of highly focused laser light. I explained in my prior paper that matter-antimatter particle annihilations in my inventive chamber should generate tiny gravitational waves, and I outlined how these waves could be amplified and modulated with information for communication, and that sensitive means of detecting modulated gravitational waves may be developed, in future, to receive such communication [5]. The advantages of this type of communication would be that such signals can travel through the Earth, moon, planets, comets, stars, and dust-clouds, without attenuation or degradation of signal, and that they can travel faster than radio waves or other types of light that has to be bounced from satellite to satellite, rather than travelling directly through the Earth.

Other potential applications of my research may be developed including: 1. Containment and manipulation of antimatter on a spacecraft for matter-antimatter propulsion; 2. Confinement of a large amount of accumulated light to warp spacetime enough to study gravitational warp mechanics and engineering and, potentially, to serve as a means of propulsion; 3. Projection of living cells, in the form of de Broglie waves, through the vacuum of space; and 4. Manipulation and projection of enough

antimatter through the vacuum of space to alter a path of targets, such as meteors having dangerous trajectories.

References

1. Russell DN. Fractal tube reinforcement microengineering. In: Adams PJ, Elsworth SA, Petkauskos MJ, Walton TC, eds. Revolutionary Materials: Technology and Economics. Diamond Bar, CA: Society for the Advancement of Material and Process Engineering (SAMPE); 2000:224-230. Accessed online at: https://www.nasampe.org/store/viewproduct.aspx?ID=4288251
2. Russell DN. Fractal tube reinforcement. US patent 5,707,724. Issued January 13, 1998. Accessed at: https://ppubs.uspto.gov/api/pdf/downloadPdf/5707724
3. Russell DN. Process of making fractal tubes. US patent 5,928,450. Issued July 27, 1999. Accessed at: https://ppubs.uspto.gov/api/pdf/downloadPdf/5928450
4. Shimoji Y, Russell DN. Laser fabrication of continuous nanofibers. US patent application 20050255033. Published November 17, 2005. Accessed at: https://ppubs.uspto.gov/api/pdf/downloadPdf/20050255033
5. Russell DN. Fractal laser cone structures proposed to confine antimatter. Adv Aerosp Sci Technol. 2022;7(4). doi:10.4236/aast.2022.74011. Available at: https://www.scirp.org/journal/paperinformation?paperid=121235
6. Russell DN. Proposed double-slit experiments colliding antimatter with matter, and live spores with protons. Open J Microphys. 2025;15(3). doi:10.4236/ojm.2025.153003. Available at: https://www.scirp.org/journal/paperinformation?paperid=144553