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Speed of Gravity: A Simple Experiment to Test the General Relativity Theory

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Abstract

In this article, the author has suggested a simple experiment that can detect the time-lagged/instantaneous seismic effect due to the fluctuation of solar activity to prove/disprove the General Theory of Relativity.

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Scientists of LIGO and VIRGO, along with their 133 collaborators, have claimed that they have conclusively detected [1] the gravitational waves in their specially constructed laboratories costing billions of dollars. But James Creswell et al. [2][3] of some reputable research institutes in Denmark, Hao Liu et al.[4], Brookes [5], Jackson et al. [6], Sabine Hossenfelder [7], Alexander Unzicker [8], and many others [9] have not accepted this claim.
Creswell et al. [2] opine, “The results presented here suggest this level of cleaning has not yet been obtained and that the detection of the GW events needs to be re-evaluated with more careful consideration of noise properties.”

Creswell et al. [3] also write, “We note, however, that a potential increase in the BBH masses would raise fundamental questions regarding their origin.” [BBH: Binary Black Hole].

According to Hao Liu et al.[4], “We have presented one such approach here and used it to analyze the data for GW150914. Cases in which the signals are too weak to permit unbiased determination and which therefore require the use of templates for signal detection should be regarded with extreme caution: It is likely that the conclusions of such analyses will be determined by theoretical preconceptions and not by the data itself.”

Brooks [5] comments: “The paper on the first detection used a data plot that was more ‘illustrative’ than precise.” He further adds, “Jackson’s group says the decisions made during the LIGO analysis are opaque at best and probably wrong.”

According to Jackson et al. [6], “It is a truism that if gravitational waves are all you look for, gravitational waves are all you will ever find.”

Lost in Mathematics author Sabine Hossenfelder [7], presently a Research Fellow at the Frankfurt Institute for Advanced Studies, comments on the detection: “This gives me some headaches, folks. If you do not know why your detector detects something that does not look like what you expect, how can you trust it in the cases where it does see what you expect?”

Alexander Unzicker [8] writes on the detection, “Nothing is more difficult than not to deceive yourself — Ludwig Wittgenstein.”
The scientists of LIGO-VIRGO believe that gravitational waves cause space itself to stretch in one direction and simultaneously compress in a perpendicular direction. This causes one arm of the Michelson interferometer to get longer while the other gets shorter, and then vice versa, back and forth as long as a gravitational wave is passing towards the interferometers.

As the lengths of the arms change during the propagation of gravitational waves, so too do the distances traveled by each laser beam. A beam in a shorter arm will return to the beam splitter before a beam in a longer arm. Then, the situation reverses.

So, when a gravitational wave passes through the Michelson Interferometer, its detector will register a fringe shift that should be the measure of the strength of the passing gravitational wave.

The LIGO-VIRGO scientists assume that the speed of light in both the spaces that are steadily stretching and steadily compressing is the same ‘c’ as that of light in free space.

According to Maxwell, the speed of light in free space is ‘c’, which is well-verified by experiments. SRT accepts this proposition. But it has not been proved to this day by experiments that the speed of light is the same ‘c’ in the stretched and contracted spaces contrived by the relativists.

To justify the theoretical foundation of the LIGO-VIRGO experiments, LIGO-VIRGO experts should prove, through an independent experiment, that the speed of light is indeed the same ‘c’ in those steadily stretching and compressing spaces, just as it is in free space. They have not done this yet. Therefore, the GW detection process of the LIGO-VIRGO does not have any scientific foundation [9].

However, GW detection is a high-cost, high-lab, high-math, and high-headache experiment. Let the great detectors and their great opponents continue to debate over the detection.

As to Newton, the action of gravitation is instantaneous, whereas as per Einstein, this action too travels with the speed of light, and the latter consideration has been used by LIGO and VIRGO. However, whether the action of gravitation is instantaneous or time-lagging has not been demonstrated in any reliable experiment just like many other propositions of the relativists.

Maxwell’s equations show that light travels with a speed of ‘c’ in the free space. This famous equation of Maxwell is called the homogeneous wave equation. This equation does not tell us anything about the speed of the electric and magnetic fields in the free space.

However, in electromagnetism, the Lorenz gauge condition is generally used in calculations of time-dependent electromagnetic fields through retarded potentials and that may imply that the speed of the electromagnetic field is ‘c’.

Any experiment in electrodynamics does not contradict this conclusion.

Albert Einstein accepts this conclusion.

In the case of Newton’s law of gravity, the gravitational force acts instantly. No experiment to this day contradicts this conclusion.

But many physicists believe that gravity should have speed and Albert Einstein thinks that gravity has the speed of ‘c’.

One important point to remember here is that the electric field and the magnetic field are medium-dependent fields but gravity acts independently of the type of medium.
Therefore, we should not jump to any conclusion on the speed of gravity from the consideration of prevailing covariant faith in physics.

To know the truth a correct experiment should be done. We know that “Maximum quake frequency occurs at times of moderately high and fluctuating solar activity. Terrestrial solar flare effects which are the actual coupling mechanisms that trigger quakes appear to be either abrupt accelerations in the earth's angular velocity or surges of telluric currents in the earth's crust” [10].

Fluctuations in solar activity have many such effects on seismic activity, which could be studied accurately. The fluctuations of solar activity could also be accurately and continuously photographed. Now, matching this fluctuation with seismic activity, it is possible to know whether there is a time lag of 499 seconds between the physical effects and electromagnetic effects propagated from the Sun to the Earth. This seems to be a simple, low-cost, low-lab, low-math, and low-headache experiment.

The great experimenters of LIGO-VIRGO should try this simple experiment to continue their great contributions to physics!

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