LIGO Gravitational Wave Event as Observed by Network of Quantum Gravity Detectors

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March 2016

Abstract

The LIGO team, operating two vacuum-mode Michelson interferometers reported the detection, on September 14, 2015, of a gravitational wave event of some 0.2sec duration, which was claimed to have been generated by two black holes merging a billion years ago. However experimentally it has been shown that such vacuum mode interferometers have zero sensitivity to gravitational waves, which have indeed been detected using other techniques over the last 100+ years. One such recently discovered technique uses quantum barrier electron tunnelling current fluctuations in reverse biased diodes, generated by dynamical 3-space fluctuations: gravitational waves. These are Quantum Gravity Detectors (QGD). There happens to be an international network of such detectors, and the data from this network shows a significant event at the same time as the LIGO event, but extending over some 4sec duration. Previously in 2014 such Quantum Gravity Detectors detected gravitational waves generated by the resonant Earth vibrations, whose frequencies were known from seismology. It is suggested that the LIGO event may have been an Earth generated gravitational wave event that was detected by the electronics of the LIGO measuring and recording system, an effect previously discovered in 2014 using time-delayed correlated fluctuations in data recorded by oscilloscopes located in Australia and London.

1 Introduction

The LIGO team, operating two vacuum-mode Michelson interferometers reported the detection, on September 14, 2015, of a gravitational wave event of some 0.2sec duration, which was claimed to have been generated by two black holes merging a billion years ago [1]. However experimentally it has been shown that such vacuum mode interferometers have zero sensitivity to gravitational waves, which have indeed been detected using other techniques over the last 100+ years [2–5], with one technique being the analysis of NASA Doppler Shift data from from Earth-flby spacecraft [6]. One such recently discovered technique [7,8] uses quantum barrier electron tunnelling current fluctuations in reverse biased diodes, generated by dynamical 3-space fluctuations: gravitational waves. There happens to be an international network of such detectors (Misnamed Random Event Generators, REG, forming the *Global Consciousness Project*, [9]. Data [10] from this network, reported herein, shows a significant event at the same time as the LIGO event, but extending over some 4sec duration. Previously, in 2014, such Quantum Gravity Detectors detected gravitational waves generated by the resonant Earth vibrations [11], whose frequencies were known from seismology. It is suggested that the LIGO event may have been an Earth generated gravitational wave event that was detected by the electronics of the LIGO measuring and recording system, an effect previously discovered in 2014 using time-delayed correlated fluctuations in data recorded by oscilloscopes located in Australia and London [7].

The quantum theory of gravity explains the gravitational acceleration of matter as caused by the refraction of quantum waves by the time dependence and spatial inhomogeneities of the dynamical space flow [8, 12]. This has been tested against numerous experimental gravitational phenomena [3]: bore hole g anomalies, flat spiral galaxy rotation curves, black hole systematics and star orbit data [13–15], lensing of light by stars and galaxies, expanding universe supernova redshift-brightness data without need for dark matter or dark energy [15], anisotropic Brownian motion [16] and directional dependence of nuclear decay rates [17]. The key initial experiments detected the dynamical space via light speed anisotropy gas-mode Michelson optical interferometers and EM speed anisotropy in RF coaxial cables [2]. More recently quantum detectors have been discovered that directly detected the space flow [7,14]. All these different experimental techniques reveal a turbulent space flow speed from direction RA $\sim 4.5hrs$, Dec=80°S, with a speed of ∼500km/s. These velocities are moderated over a year by the orbital motion of the Earth, see Fig.3. A key point is that dynamical space it not intrinsically a geometrical system, but exhibits an effective geometric measure at increasing length scales [20].

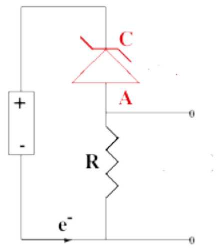

Fig. 1: Basic circuit of Zener Diode Space Quantum Gravity Detector, showing battery, a zener diode operating in reverse bias mode below the Zener voltage, and resistor R. The voltage across the resistor is measured and used to determine the turbulent space flow driven fluctuating tunnelling current through the diode. Voltages, at 1 sec intervals, from the network of such commercial Quantum Gravity Detectors are shown Figs.5, 6 and 7: data from [10]. These commercial detectors are known as Random Event Generators (REG) on the incorrect assumption that the fluctuating electron currents are random and uncorrelated. However the experimental data in [8] shows that such detectors with the diodes collocated and parallel generate the same current fluctuations: they are generated by the space flow turbulence moving through at the diode location

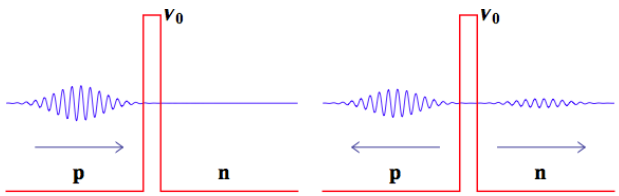

Fig. 2: Incident electron wave function before (Left) and after barrier quantum transmission and reflection (Right), with p and n denoting semiconductor type, showing partially transmitted component and partially reflected component, when the diode is operated in reverse-bias mode, as shown in Fig.1. Space flow fluctuations raise and lower the energy of the incident wave function (3), which changes the relative magnitude of these two components.

2 Quantum Gravity

Dynamical space [8, 20] , which is observed to have a fractal structure, is a phenomenon repeatedly detected by a variety of experimental techniques [3], such as light speed anisotropy detected by gas-mode Michelson interferometers, EM speed anisotropy in RF coaxial cables and Doppler shifts from spacecraft Earth-flybys [6]. Light speed anisotropy requires that Maxwell's EM equations be modified by the replacement of the usual time derivative by the Euler time derivative:

$$\partial/\partial t \rightarrow \partial/\partial t + \mathbf{v}(\mathbf{r},t)\cdot\nabla \qquad (1)$$

where $\mathbf{v}(\mathbf{r},t)$ is the classical field description of the dynamical space velocity, at location and time used by the observer. This modification was first suggested by Hertz [19] in 1890. When using the appropriate and detected space inflow velocity component for the Sun this results in the observed bending

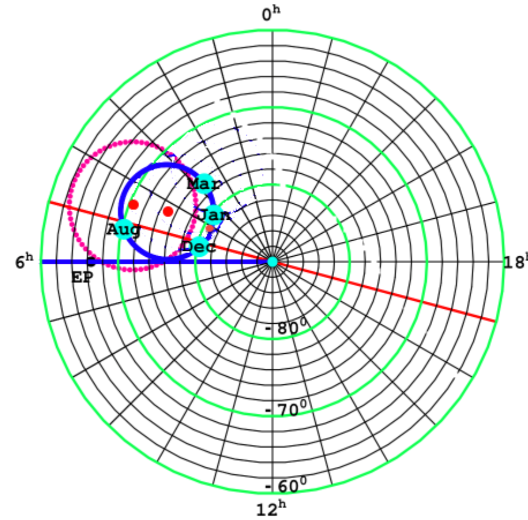

Fig. 3: South celestial pole region. The dot (red) at RA=4.3^h, Dec=75°S, and with speed 486km/s, is the direction of motion of the solar system through space determined from NASA spacecraft earth-flyby Doppler shifts, [6], revealing the EM radiation speed anisotropy. The thick (blue) circle centred on this direction is the observed velocity direction for different days of the year, caused by earth orbital motion and sun 3-space inflow. The corresponding results from the Miller gas-mode interferometer are shown by 2nd dot (red) and its aberration circle (red dots). For December 8, 1992, the velocity is RA=5.2^h, Dec=80°S, speed 491km/s, see Table 2 of [6].

of star light by the Sun. The Schrödinger equation must also be extended by using the Euler time derivative in (1), [12]:

$$i\hbar\frac{\partial\psi(\mathbf{r},t)}{\partial t} = -\frac{\hbar^2}{2m}\nabla^2\psi(\mathbf{r},t) + V(\mathbf{r},t)\psi(\mathbf{r},t) \\ -i\hbar\mathbf{v}(\mathbf{r},t)\cdot\nabla\psi(\mathbf{r},\mathbf{t}) \qquad (2)$$

An analogous extension is also necessary in the Dirac equation [4]. The presence of the $-i\hbar\mathbf{v}\cdot\nabla$ dynamical space term provides a critical test of the emergent quantum gravity theory. For plane wave electrons, $\psi \sim e^{(i\mathbf{k}\cdot\mathbf{r}-i\omega t)}$, the space interaction term changes the energy of the electrons quantum tunnelling through the Diode quantum barrier. For uniform $\mathbf{v}$:

$$E = \hbar\omega \rightarrow \hbar\omega + \hbar\mathbf{k}\cdot\mathbf{v} \qquad (3)$$

This space flow induced energy shift changes the potential energy barrier electron quantum tunnelling amplitudes in a reverse-biased Zener diode. This effect is easily measured by means of the circuit in Fig.1. A critical implication is that the electron tunnelling current must depend on the angle θ between $\mathbf{k}$ and $\mathbf{v}$, as in in $\mathbf{k}\cdot\mathbf{v} = kv\cos(\theta)$, as experimentally demonstrated in [8]. This angle effect is also apparent in Figs. 5 and 6.

A significant effect follows from (2), namely the emergence of gravity as a quantum effect: an Ehrenfest wave-packet analysis [12] reveals the classical limit and shows that the acceleration $g(\mathbf{r},t)$ of a localised wave packet, due to the space terms alone, when $V(\mathbf{r},t)=0$, is

$$g(\mathbf{r},t)=\frac{d^2\langle\mathbf{r}\rangle}{dt^2}=\frac{\partial\mathbf{v}}{\partial t}+(\mathbf{v}\cdot\nabla)\mathbf{v} \tag{4}$$

That derivation showed that the acceleration is independent of the mass m: whence we have the derivation of the Weak Equivalence Principle, discovered experimentally by Galileo.

Note that the emergent quantum-theoretic matter acceleration in (4), is also, and independently, the constituent acceleration $\mathbf{a}(\mathbf{r},t)$ of the space flow velocity field,

$$\begin{aligned}\mathbf{a}(\mathbf{r},t)&=\lim_{\Delta t\to 0}\frac{\mathbf{v}(\mathbf{r}+\mathbf{v}(\mathbf{r},t)\Delta t,t+\Delta t)-\mathbf{v}(\mathbf{r},t)}{\Delta t}\\ &=\frac{\partial\mathbf{v}}{\partial t}+(\mathbf{v}\cdot\nabla)\mathbf{v}\end{aligned} \tag{5}$$

which describes the acceleration of a constituent element of space by tracking its change in velocity. This means that space has a structure that permits its velocity to be defined and detected, which experimentally has been done. This then suggests, from (4) and (5), that the simplest dynamical equation for $\mathbf{v}(\mathbf{r},t)$ is

$$\nabla\cdot\left(\frac{\partial\mathbf{v}}{\partial t}+(\mathbf{v}\cdot\nabla)\mathbf{v}\right)=-4\pi G\rho(\mathbf{r},t);\ \ \nabla\times\mathbf{v}=\mathbf{0} \tag{6}$$

because it then gives $\nabla.\mathbf{g}=-4\pi G\rho(\mathbf{r},t)$, $\nabla\times\mathbf{g}=\mathbf{0}$, which is Newton's inverse square law of gravity in differential form. Hence the fundamental insight is that Newton's gravitational acceleration field $\mathbf{g}(\mathbf{r},t)$ for matter is really the acceleration field $\mathbf{a}(\mathbf{r},t)$ of the structured dynamical space and that quantum matter acquires that acceleration because it is fundamentally a wave effect, and the wave is refracted by the accelerations of space. While (6) to the simplest 3-space dynamical equation, this derivation permits further terms which maintain Newton's inverse square law external to a spherical mass, but which otherwise leads to new observed aspects of gravity, which have previously been ascribed to "dark matter", but which are now revealed to be a dynamical aspect of space. This has been tested against numerous experimental gravitational phenomena [3]: bore hole g anomalies, flat spiral galaxy rotation curves, black hole systematics and star orbit data [13–15], lensing of light by stars and galaxies, expanding universe supernova redshift-brightness data without need for dark matter or dark energy [15], anisotropic Brownian motion [16] and directional dependence of nuclear decay rates [17]. Experimental data reveals a cosmic space flow of some 500km/s, it also implies inflow components into the Earth and the Sun, which have also been detected [6] .

Most electronic devices exhibit Johnson noise [21], where the electron current has a characteristic $1/f$ spectrum. The origin of this noise has never been explained until now. Johnson noise is thus a consequence of the fractal structure of the space flow.

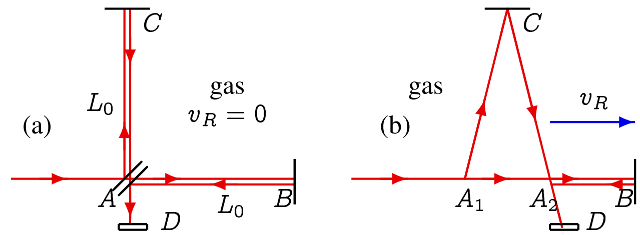

Fig. 4: Schematic diagrams of the gas-mode Michelson Interferometer, with beam splitter/mirror at A and mirrors at B and C mounted on arms from A, with the arms of equal length L_0 when at rest. D is the detector screen. In (a) the interferometer is at rest in space. In (b) the instrument and gas are moving through 3-space with speed v_R parallel to the AB arm. Interference fringes are observed at D when mirrors B and C are not exactly perpendicular - the Hick's effect. As the interferometer is rotated in the plane shifts of these fringes are seen in the case of absolute motion, but only if the apparatus operates in a gas. By measuring fringe shifts the speed v_R may be determined.

3 LIGO Vacuum Mode Interferometers

The design and calibration of the LIGO vacuum mode Michelson interferometers is based on the assumed validity of Special Relativity and General Relativity. There the key assumption is that the speed of light is invariant for all observers. However no experiment has ever confirmed the light speed isotropy. As well there are numerous failings of the GR theory of gravity, which required the introduction of unobserved dark matter and dark energy. The relativity theory which is consistent with all experiments is neo-Lorentz Relativity, in which motion of objects and clocks wrt the dynamical space results in the detected length contraction and clock slowing effects [3–5], and in which the speed of light and other EM radiation through space is invariant wrt that local dynamical space. Using neo-Lorentz Relativity the operation and calibration of Michelson interferometers is easily determined [4]. The travel time difference, Δt, between the arms of the interferometer Fig.4, which is measured using interferometry, is given by

$$\Delta t=k^2\frac{Lv_R^2}{c^3}cos(2(\theta-\psi)) \tag{7}$$

where L is the interferometer arm length, v_R is the speed of the dynamical space projected onto the plane of the interferometer and the angles measure the rotation of the arms relative to the the direction of v_R, Fig4. The calibration constant is $k^2=n^2-1$, where n is the refractive index of the gas in the light paths of the interferometer. In the Michelson-Morley (1887) and Miller (1925-26) gas-mode interferometer experiments the dielectric was air, for which $n=1.00029$, giving $k^2=0.0006$ and so much less sensitive than assumed by Michelson, namely $k^2=1$ assuming Newtonian physics. Nevertheless the fringe data from these experiments reveal a

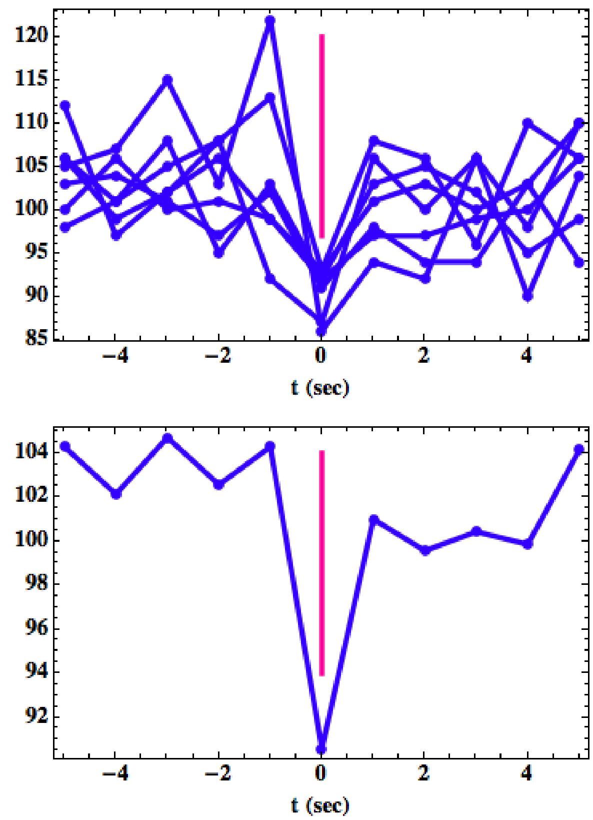

Fig. 5: Top: Data from QGDs showing a significant dip in the signal at the time of the LIGO event, at time $t = 0$, and Bottom: the average from the Top data.

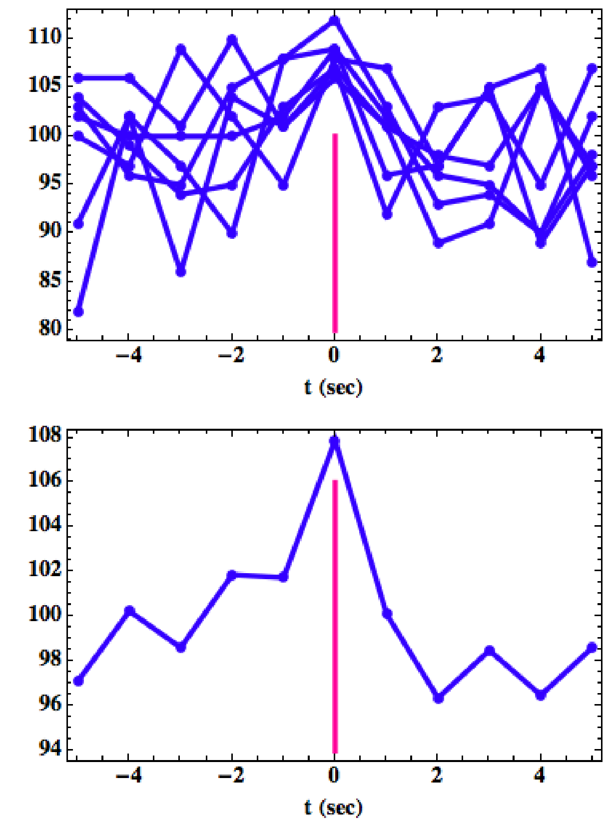

Fig. 6: Top: Data from QGDs showing a significant rise in the signal at the time of the LIGO event, at time $t = 0$, and Bottom: the average from the Top data.

speed of some 500km/s from a near southerly direction. However for LIGO $n = 1$, for a vacuum, giving $k^2 = 0$, and so the LIGO interferometers have zero sensitivity to the space flow turbulence: gravitational waves. The only way LIGO can react to such waves is by means of Johnson noise induced in the electronics [8, 21]. But then the LIGO calibration constant, assumed by the GR theory for the device is inappropriate, leading to the incorrect identification of the source of the LIGO event, namely a black hole merger 1 billion years ago. Of course putting air into the LIGO vacuum arms would permit LIGO to actually detect dynamical space turbulence: gravitational waves.

4 Data from Quantum Gravity Detectors

We now reveal the data from the GCP network [9] of Quantum Gravity Detectors, known as Random Event Generators (REG), but with better physics now known as Quantum Gravity Detectors (QGD). The LIGO event occurred at 9:50:45 hrs UTC on September 14, 2015. Data from that day was downloaded from [10], which has data every 1sec recorded against UTC for 47 detectors located in numerous countries.. An issue with these commercial detectors is that the orientation of the diodes is unknown, which means that the effect of the angle dependence $\mathbf{k}\cdot\mathbf{v} = kv\cos(\theta)$ in (3) is unknown. So a detector response may vary from a decreased E, and so decreased signal, or an increased E and an increased signal, or even an unchanged E resulting in no change in signal. For this reason the data from the various detectors is split into three groups, and shown in Figs.5, 6, 7. The data in Figs.5 and 6 show a remarkable coincidence with the LIGO event, subject to the 1sec nominal timing of the QGD data. However the data in Fig.5, Top, also shows another significant effect, namely in-phase responses of the detectors in the 2secs before and after the LIGO event. The LIGO reported data [1] does not reveal data during these times. Overall it is not possible to determine the origin of this event other than it could be consistent with a major Earth centred mass movement.

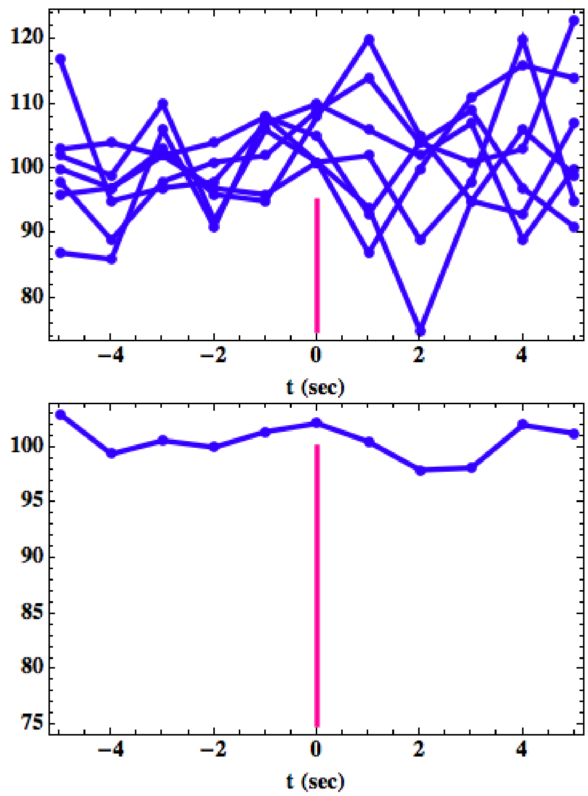

Fig. 7: Top: Data from QGDs showing no significant signal at the time of the LIGO event, at time $t = 0$, and Bottom: the average from the Top data. For these detectors the angle in (3) may be near 90^0. One detector showed a dip at 2sec after the LIGO event, which may be a timing error.

5 Conclusion

Most of physics of the last 100 years has been confused by the design flaw in the Michelson interferometer, but that is now understood, and the light speed anisotropy of ±500km/s has been repeatedly measured by using numerous techniques, and so invalidating the key assumption of SR and GR, and the supposed existence of spacetime [5]. A dynamical space does exist, and plays a key role in all phenomena. Dynamical space is the cause of gravity, a quantum phenomenon, as confirmed by experiment [8]. The QGD network, fortuitously run by the Global Consciousness Project (GCP), has confirmed the existence of a space flow event, but whose interpretation by LIGO remains doubtful. Note that the events in the 2sec interval before and after the LIGO event, in Figs.5 and 6, are inconsistent with the black hole merger interpretation. We are now entering an era of new physics.

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