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Com Quantum Proof of LIGO Binary Mergers Failure

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LIGO claims to have detected a large number of ancient and distant binary merging gravitational waves. However, only the frequency of GW150914 signal increases significantly and monotonously, showing the expected characteristics of spiral double star merger, but it is highly similar to the engine operating frequency in the starting process of contemporary fighter. LIGO observers should know which is more likely. Other signal waves of LIGO have no research value due to lack of detailed data. Here, I further analyzed the frequency distribution and change law of GW150914 signal, and proved the unreliability of its spiral double black hole merger assertion by fitting the precise recurrence relationship of the frequency of GW150914 waveform with macro quantization significance. The specific process and conclusions are as following. Firstly, the characteristic equation for effectively correcting the amplitude time of the waveform is proposed, the specification conditions for the numerical analysis method of the minimum solution of the characteristic Diophantine equations are determined, the new correction value of the amplitude time of the GW150914 waveform is given, and then the quantized recurrence equation characterizing the frequency distribution of the signal is obtained. Then, the complex but clear data processing program for drawing the com quantum theory waveform is introduced, and the standard waveform of GW150914 waveform is drawn. It is pointed out that the drawing of the LIGO numerical relativistic waveform is opaque, and the conclusion is fuzzy and lacks due scientific analysis. Then, the iconic maximum frequency of the merger event of GW150914 signal wave source supposed to be a spiral double star is calculated, and it is confirmed that this characteristic frequency is missing in the GW150914 waveform. The reason why neither Hanford waveform nor Livingston waveform has the corresponding characteristic frequency band is further analyzed, which proves that the merger of the GW150914 spiral double black holes of LIGO is not successful, It means that the LIGO signal is far more likely to be the signal of the start-up of modern fighter on the ground than the gravitational wave of the merger of ancient and far away spiral binaries. Finally, an experimental proposal for detecting the gravitational wave of the simulated spiral double star system is proposed to effectively test the confidence of the laser interference gravitational wave detector.

Keywords: GW150914 waveform; numerical analysis; Diophantine equations; Spiral binary black hole; Dongfang com quantum law; frequency recurrence equation; Donfang characteristic frequency.

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1 Introduction

Experimental reports that can not repeat the observation results, some are illusions about similar phenomena, and some are lies. Imagine that the ancient and distant dense binaries merge frequently at a specific time, and the merged information happens to be transmitted to the earth and captured by LIGO according to the foresight of research institutions in recent years. There will be no such opportunity after that, because all spiral binary stars have been merged. In particular, highly similar signals on the ground, such as those generated by the start-up of modern fighter aircraft, can be recognized as noise and accurately filtered out. This wonderful story is obviously unconvincing. Therefore, it is most appropriate to define the so-called spiral binary stars merger gravitational wave declared by LIGO as LIGO manufacturing.

The vibration curves depicted by LIGO are called waveforms. The monotonic increase in frequency of GW150914 waveform[1] is only qualitatively consistent with the radiation frequency of the spiral system, and many other signals such as locomotive start also have the monotonic increase in frequency. The identification of signal wave of unknown wave source needs to compare the accurate law obeyed by physical quantities such as the frequency of the original detection data of the signal with the accurate law of physical quantities such as the radiation frequency of the model wave source. However, according to the theoretical waveform, the expected waveform is extracted from the chaotic waveform, and then the extracted waveform is used as evidence to declare that the so-called experimental observation confirms the theoretical inference. This kind of strong twist-

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ed chaotic logic is defined as modern advanced scientific thought only because we succumbs to the academic authority of the famous scientific research team. How long can its vitality last?

It is a serious misunderstanding of the law of nature to put general relativity above gravitational waves[2-4] and believe that there will be no gravitational waves without general relativity. Relativity itself is not an inevitable theory to describe the laws of nature[5,6]. Extraction of LIGO data[7-10,28] completely depends on the waveform template of general relativity gravitational wave theory[11-15]. If the actual operation is like this and is publicized as a hard and effective work, its playful color is very strong. The so-called signal wave data is obviously not the data of real observation significance, but data that has been seriously tampered with or even fabricated in disguise. After extracting the desired waveform from the chaotic mixed waveform through the theoretical template, it is determined that it is the gravitational wave generated during the merger of ancient and distant spiral binary black holes, just like drawing a curve in the desert according to a function graph, taking photos, and then determining that the curve is the footprint of aliens. If a spiral binary exists, the frequency of the gravitational wave radiated by it increases monotonously. Gravity theory holds that the frequency of the gravitational wave should meet the nonlinear Blanchet equation[16,17]. Although the Blanchet frequency equation has no explicit function solution and it can not be used to calculate the accurate frequency distribution law of gravitational wave, the conclusion of numerical analysis is that the frequency of GW150914 signal does not obey the Blanchet frequency equation[18].

It can be predicted that the gravitational quantization theory represented by string theory, superstring theory and M theory combines general relativity with quantum mechanics and can not calculate the most basic characteristic physical quantities such as the frequency or wavelength of the gravitational wave. Formally, if we imitate the quantum theory of the hydrogen atom[19-25] to establish the quantum theory of the gravitational system, it seems that the calculation formula of the frequency or wavelength of gravitational wave can be given. However, in this way, the picture of matter cloud in the gravitational field predicted by the imitation theory is not consistent with the distribution law of planets, and the derived radiation frequency formula of spiral binaries does not accord with the discrete frequency distribution and variation law of GW150914 waveform. In fact, the assumptions and principles of quantum mechanics used to describe micro motion also have their specific scope of application, even do not conform to logic[6,26,27], and can not be directly used to describe the macro motion law dominated by universal gravity. If only from the perspective of the monotonic increase of the frequency of GW150914 waveform, it is claimed that this signal is a spiral binary and must be the gravitational wave generated by the merger of spiral binary black holes, its reliability is obviously far from enough. Through in-depth analysis of the frequency and amplitude distribution law of GW150914 waveform wave, it can be found that it is very likely to come from the analog device, but the com quantization laws shown by the frequency of this signal are still of research value. It will promote understanding of the macro quantization law of variable frequency signal. This is why we take it as the experimental basis of com quantum theory.

Now, suppose that GW150914 waveform comes from a certain frequency conversion rate movement, we further study the frequency distribution law of GW150914 waveform. Firstly, the plausible amplitude time is extracted from the GW150914 waveform data released by LIGO, the characteristic equation satisfied by the amplitude time or the corresponding frequency is found, and the specification condition of the minimum solution of the characteristic Diophantine equations is determined. Then, the characteristic equation is used to accurately correct the wide peak or uncertain peak of GW150914 waveform, and fit the com quantized frequency recurrence equation according to the minimum solution of the characteristic Diophantine equations. In order to compare with LIGO's numerical relativistic waveform, the numerical drawing procedure of complex but not intended to the mystify waveform of com quantum theory is provided here, and the com quantum standard waveform of GW150914 waveform is drawn. It is of great significance to calculate the maximum characteristic frequency of GW150914 waveform. Because if GW150914 waveform comes from the gravitational radiation of spiral binary stars merge, then, from the precession process to the oscillation process, the binary star must radiate at least one peak pulse corresponding to one of the characteristic frequencies. However, the characteristic pulse is missing in both Hanford waveform and Livingston waveform. It is necessary and important to find out the cause of disappearance with theoretical and experimental significance. In addition, considering that the experimental observation results should be repeatable, an experimental proposal for detecting the gravitational wave simulating spiral motion in the laboratory is also proposed. The purpose is to further confirm the confidence of the gravitational wave laser detector and increase the experience of identifying the gravitational wave through repeatable experiments.

2 Frequency recurrence equation of GW150914 waveform

The displacement of all vibration curves of LIGO is called strain. The frequency of the main vibration part of GW150914 waveform increases monotonously, and the main vibration part of the Hanford waveform of the GW150914 waveform coincides with of the Livingston waveform that the positive and negative strains overturned and the time delayed 7.324218ms. As shown in Figure 1, the real line segment indicates the correction time of the positive and negative strain peak of the superimposed waveform, while the virtual line segment represents the time of the distorted positive and negative strain peak. With the inverse time sequence number, the last positive or negative strain peak corresponding to the maximum frequency of the monotonically increasing frequency corresponds to the smallest quantum number $n = 1$. Investigating the several wide peaks of the main vibration part in the superimposed waveform, in addition to noise resulting in waveform distortion, noise may lead to waveform distortion, and the detector may also miss some real positive and negative strain peaks by recording a signal per 6.10352×10^{-5}s. Therefore, correction time of strain peak within the range of error has many kinds of accessibility values. Table 1 lists the time of the positive and negative strain peaks corrected by numerical approximation, and the time for the two wide positive strain peaks that have not been determined is represented by x_5 and x_7 respectively, and the time for the three wide negative strain peaks that have not been determined is represented by t_3, t_7 and t_8, respectively. The intrinsic period and the intrinsic frequency are defined as $T_n = t_n - t_{n+1}$ and $f_n = T_n^{-1}$ respectively, in which the subscript n is also quantum number and arranged in reverse chronological order.

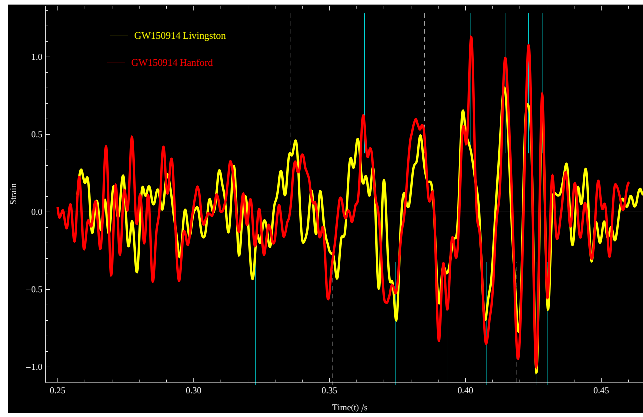

Figure 1 The superposition of the Hanford and Livingston waveforms of the GW150914 waveform

Table 1 Positive and negative strain peak times of GW150914 waveform and its frequency distribution

n	Positive strain		Negative strain	
	t_n /s	T_n /s	t_n /s	T_n /s
1	0.428222656	0.005065918	0.430297903	0.004333505
2	0.423156738	0.008568080	0.425964398	$0.425964398 - t_3$
3	0.414588658	0.012597024	t_3	$t_3 - 0.407859272$
4	0.401991635	$0.401991635 - x_5$	0.407859272	0.014622451
5	x_5	$x_5 - 0.362882581$	0.393236822	0.018832351
6	0.362882581	$0.362882581 - x_7$	0.374404471	$0.374404471 - t_7$
7	x_7	$x_7 - x_8$	t_7	$t_7 - t_8$
8	x_8		t_8	

Finding the minimum solution of the Diophantine equation system[29-31] which accords with the physical meaning can determine the best approximation equation of com quantum law, and the resulting Lagrange frequency change rate of the positive and negative strain from the GW150914 singal is the same. Studying the simplest com quantized oscillating function $y = \sin\left[2\pi\left(1+5t\right)t\right]$ with high frequency approximation shows that the same change law of positive and negative strain peak time is a kind of high frequency effect, but when the frequency is low, the time distribution law of the positive and negative strain will show a significant difference.

The GW150914 waveform belongs to the high frequency signal wave. Being similar to the Lagrange frequency change rate, the ratio $f_{n+1}f_n^{-1}$ of the adjacent frequencies of the positive and negative vibration peaks of high frequency signal waves is decided by the quantum number n. Because the exact function of the frequency f_n can always be expressed to be the Laurent series on the quantum number n, $f_n f_{n+1}^{-1}$ is the ratio of the two Laurent series. Referring to the spectral law of hydrogen atoms, other smaller frequencies can be determined by using the maximum or higher frequencies. So the other smaller frequencies can be determined by the maximum frequency. The two series of series are truncated, and the approximate rational formula of $f_{n+1}f_n^{-1}$ is a nonlinear recurrence equation with no simple function solution.[32]. After the truncation of the series, the retained terms can be the same or different, but the approximate rational formula obtained by the truncation series must conform to the following physical meaning:

1) $f_{n+1}f_n^{-1}$ is a monotone decreasing function of quantum number$n$, otherwise, 0 points and singularities destroy the radiation rule of binary stars, and there is a quasi quantum number problem which can lead to a similar black hole horizon;

2) The larger the quantum number is, the closer the

adjacent frequency is, and so there is a limit value of $\lim_{n\to\infty} f_{n+1}f_n^{-1}=1$, which indicates that the highest power of the numerator and the denominator of $f_{n+1}f_n^{-1}$ are the same, and the coefficients of the highest power term are the same.

The approximate formula of the adjacent frequency ratio of the GW150914 signal which satisfies the above two conditions is the rational formulas of the coefficients to be determined. Here we take the following form,

$$\frac{f_{n+1}}{f_n}=\frac{kn^3+an^2+bn+c}{kn^3+dn^2+en+f}=\frac{T_n}{T_{n+1}} \tag{1}$$

where k, a, b, c, d, e, f are all undetermined constants, pulsing the undetermined normal strain peak time x_5 and x_7 or negative strain peak time t_3 and t_7 in Table 1, there are 11 unknown parameters, and the reduced parameters after reduction are 10.

$$\begin{aligned}
&\frac{T_4^+}{T_5^+}=\frac{0.401991635-x_5}{x_5-0.362882581}=\frac{0.014622451}{0.018832351}=\frac{T_4^-}{T_5^-}\\
&\frac{T_1^+}{T_2^+}=\frac{0.005065918}{0.008568080}=\frac{0.004333505}{0.425964398-t_3}=\frac{T_1^-}{T_2^-}\\
&\frac{T_5^+}{T_6^+}=\frac{x_5-0.362882581}{0.362882581-x_7}=\frac{0.018832351}{0.374404471-t_7}=\frac{T_4^-}{T_5^-}\\
&\frac{1^3k+1^2a+1b+c}{1^3k+1^2d+1e+f}=\frac{0.005065918}{0.008568080}=\frac{0.004333505}{0.007329336}\approx\frac{311}{526}\\
&\frac{2^3k+2^2a+2b+c}{2^3k+2^2d+2e+f}=\frac{0.008568080}{0.012597024}=\frac{0.007329336}{0.01077579}\approx\frac{1629}{2395}\\
&\frac{3^3k+3^2a+3b+c}{3^3k+3^2d+3e+f}=\frac{0.012597024}{0.017093816}=\frac{0.01077579}{0.014622451}\approx\frac{1678}{2277}\\
&\frac{4^3k+4^2a+4b+c}{4^3k+4^2d+4e+f}=\frac{0.017093816}{0.022015238}=\frac{0.014622451}{0.018832351}\approx\frac{5995}{7721}\\
&\frac{5^3k+5^2a+5b+c}{5^3k+5^2d+5e+f}=\frac{0.022015238}{0.362882581-x_7}=\frac{0.018832351}{0.374404471-t_7}
\end{aligned} \tag{2}$$

For the same number of quantum numbers, the ratio of the adjacent frequency or period of the positive and negative strain peaks of the GW150914 waveform are the same, so the undetermined normal strain peak time x_5 and x_7, and the negative strain peak time t_3 and t_7 satisfy the following equations respectively,

The first equation gives $x_5 = 0.384897819$s and the second equation gives $t_3 = 0.4186350615$s. So the two period values to be determined are respectively T_4^+=0.017093816s and T_5^+ =0.022015238s, and the two undetermined negative strain periods are $T_2^- = 0.007329336$s and T_3^- =0.01077579s respectively. Substituting the periods or frequencies corresponding to the first few quantum numbers into equation (1), one gets a system of Diophantine equations for 9 irreducible unknown parameters,

Among them, the last equation is used only to determine the strain peak time. The general solutions of the Diophantine equations composed of the first 4 equations are expressed by a, b and k,

$$\begin{aligned}
c&=\frac{179010775681k-136493444161a+117076892161b}{108125168641}\\
d&=\frac{108456318961a-1031492960b+161348546706k}{108125168641}\\
e&=\frac{157808689202a+109487811921b-191625152562k}{108125168641}\\
f&=\frac{407789722467k-314244792483a+271503710307b}{108125168641}
\end{aligned}$$

When $k = 32$, $a = 168$ and $b = 279$, the above new system of Diophantine equations has the minimum positive integer solution, $c = 143$, $d = 216$, $e = 471$ and $f = 333$. By replacing these coefficients into the equation (1), the simplified formula for the com quantized frequency recurrence equation is determined,

$$f_{n+1}=\frac{(n+1)\left(32n^2+136n+143\right)}{(n+3)\left(32n^2+120n+111\right)}f_n \tag{3}$$

According to the last equation of equation (2), it can be solved for the positive strain peak time $x_7 = 0.335554568$s and the negative strain peak time$t_7 = 0.351027448$s, and the corresponding periods are $T_6^+ = 0.027328013$s and $T_6^- = 0.023377023$s, respectively. These values are in the range of error.

The recurrence equation (3) is fitted by the frequency of GW150914 waveform. Using equation (3), com quantum laws satisfied by the frequency change rate of GW150914 waveform can be derived by simple algebraic operation, and the derivation process is omitted here. Recurrence relation (3) is a more basic com quantum law for spiral systems. But equation (3) is not the only best approximation, and other approximations can be fitted. The numerical results of the same quantum number are necessarily consistent within the error range. Because the quantum law is succinct and graceful, and the binding system has obvious quantum characteristics when the quantum number is small. Therefore, it is reasonable to use the possible small natural number to fit the distribution law of the discrete physical quantities as small as possible. The simplest form of undetermined characteristic recurrence equation can be conjectured according to the characteristics of frequency distribution and variation of the signal wave. Then the minimum solution of characteristic Diophantine equation system can be determined by numerical analysis, and then the specific equation can be determined, in which elimination of zero points and singularity points is the key condition for fitting the equation. The fitting of the best approximate equation often requires repeated approximation. From a practical point of view, if that the numerical calculation results are in conformity with the experimental observation data or the curve of the numerical equation is coincided with the curve of the function equation is considered as the standard, it is completely able to accept the reductive numerical equation for eliminating the zero points and the singularity points in the operation process.

3 Com quantum numerical theory standard waveform

Using the frequency recurrence relationship of GW150914 waveform, a standard waveform can be drawn and compared with the so-called numerical relativistic waveform of LIGO. The editor of Physical Reviews D believes that a simple quadratic fitting can also well estimate the strain of GW150914 waveform, so it is not necessary to draw a standard waveform by fitting the accurate law of gw150904 signal frequency. Only after practicing it in person can we know that such speculation out of thin air is not only untenable, but also covers up some important truths.

The period or frequency of signal wave of change frequency is a continuous function of time. It is difficult to determine the zero point of GW150914 waveform form and other specified strain time directly. It can be seen that drawing the numerical relativistic waveform[1] needs an open, transparent and clear data processing procedure. This section introduces the numerical fitting method and drawing procedure of the com quantum theory standard waveform whose frequency distribution meets the recurrence equation (3). The specific operation also needs the help of Excel. Although the content is cumbersome and difficult to master quickly, we will be able to experience the calculation process required to draw the numerical theory waveform, so as to reflect on the opacity of the so-called numerical relativistic gravity waveform in LIGO, and see through the intention that LIGO team apply colours to a drawing by irrelevant factors to describe GW150914 waveform: deliberately to make things look mysterious so as to divert readers' attention to the greatest extent, so that if the reader does not blindly follow the trend, he will expose his lack of knowledge and produce a sense of inferiority.

According to equation (3), the strain time in other periods can be calculated by using the strain time of the phase difference of 2π in the two adjacent periods. Using the definition inversion of the period $T_n = t_n - t_{n+1}$, this time satisfies the recurrence relation $t_n^{\pm} = t_{n-1}^{\pm} - \left(f_{n-1}^{\pm}\right)^{-1}$, which is replaced by the equation (3) to read,

$$t_n = t_{n-1} - \frac{(n+1)\left(32n^2 - 8n - 1\right)}{(n-1)\left(32n^2 + 8n - 1\right)}\left(t_{n-2} - t_{n-1}\right) \quad (4)$$

By Table 1, t_1^+ =0.428222656s and t_2^+ =0.423156738s gives the positive strain peak period T_1^+ =0.005065918s of $n = 1$, t_2^- =0.425964398s and t_2^- =0.430297903s gives the negative strain peak period T_1^- =0.004333505s $n = 1$. From this, the difference equation of positive and negative strain peak time is obtained as follows,

$$t_n^+ = t_1^+ - \left\{1 + \sum_{k=3}^{n}\left[\prod_{i=3}^{k}\frac{(i+1)\left(32i^2 - 8i - 1\right)}{(i-1)\left(32i^2 + 8i - 1\right)}\right]\right\}T_1^+$$
$$t_n^- = t_1^- - \left\{1 + \sum_{k=3}^{n}\left[\prod_{i=3}^{k}\frac{(i+1)\left(32i^2 - 8i - 1\right)}{(i-1)\left(32i^2 + 8i - 1\right)}\right]\right\}T_1^- \quad (5)$$

The time of other positive and negative strain peaks can be calculated by using the equation (5). Table 2 lists the correction times for the 11 positive strain peaks and 11 negative strain peaks of the GW150914 signal, including the corresponding frequency and period.

Table 2 Time and frequency distribution of positive and negative strain peaks of GW150914 waveform

n	Positive strain			Negative strain		
	t_n /s	T_n /s	f_n /Hz	t_n /s	T_n /s	f_n /Hz
0	0.430398110	0.002175454	459.6741012	0.4321588376	0.0018609346	537.3644033
1	0.428222656	0.005065918	197.3975891	0.430297903	0.004333505	230.7600891
2	0.423156738	0.008568058	116.7125619	0.425964398	0.007329336	136.4379995
3	0.414588680	0.012597004	79.38395511	0.418635062	0.010775789	92.80062677
4	0.401991676	0.017093789	58.50078061	0.407859272	0.014622451	68.38798934
5	0.384897887	0.022015203	45.42315599	0.393236822	0.018832351	53.10011606
6	0.362882684	0.027327971	36.59254469	0.374404471	0.023377023	42.77704585
7	0.335554713	0.0330055	30.29798064	0.351027448	0.028233724	35.41863655
8	0.302549213	0.039025938	25.62398372	0.322793724	0.033383754	29.95468968
9	0.263523275	0.045370908	22.04055515	0.289409970	0.038811400	25.76562555
10	0.218152367			0.250598570		

Referring to Planck Bohr's hypothesis of quantum mechanics, if it is determined that the energy of gravitational wave is an increasing function of frequency, and assuming that the strain of gravitational wave laser interferometer comes from the action of gravitational wave, the amplitude of signal wave should also be an increasing function of gravitational wave frequency. If GW150914 waveform is gravitational wave, then, should the abnormal part of the main vibration in the GW150914 waveform be interpreted as the waveform distortion caused by noise, or the systematic error intentionally left when extracting the waveform, or the accidental error?

It is analogous to the representation of electromagnetic wave energy, if the gravitational wave energy ε is directly proportional to the frequency f, that is, $\varepsilon \propto f$, then, because the energy of the gravitational wave is proportional to the square of the amplitude, it is further conjectured that the energy distribution is proportional to the square of the strain, $\varepsilon \propto h^2$, so $h \propto \sqrt{\varepsilon} \propto \sqrt{f}$. From this, $h_n \propto \sqrt{f_n}$, $h_{n+1} \propto \sqrt{f_{n+1}}$. In this way, two strains h_{n+1} and h_n with the phase difference of 2π satisfy the relational $h_{n+1} = \left(f_{n+1} f_n^{-1}\right)^{1/2} h_n$, that is, $h_n = \left(f_n f_{n-1}^{-1}\right)^{1/2} h_{n-1}$, in the form of (3). And then from the equation (3), one gets the result

$$h_n = \left[\frac{n\left(32n^2+72n+39\right)}{(n+2)\left(32n^2+56n+23\right)}\right]^{\frac{1}{2}} h_{n-1} \qquad (6)$$

The equation (6) is only a semi definite quantitative equation based on guesswork rather than a numerical fitting equation. In fact, it can not be proved to belong to a precise natural law at present. It is listed here only because the strain relationship it gives is in accordance with the traditional understanding and can be used as a reference for quantitative description.

Equations (5) and (6) are applied to GW150914 waveform. First, the time of the next several positive and negative strain peaks is calculated by the recurrence equation (5). The time of each period is divided into 400 equal parts with different time intervals. Then, correction values of 400 positive and negative strains of $n = 2$ are determined by the cosine function. Then, the positive and negative strains of other periods are calculated by semi-quantitative equation (6). It is necessary to select the appropriate starting time and ending time, otherwise the calculated strain distribution will be deformed in the waveform.

In 2016, I used Excel to generate 4000 groups of GW150914 waveform time strain data. The excel file is called "Com Quantum Waveform Data of GW150914 waveform 2016". It should be noted that more data can be generated by computer, and different generation superposition can also be scrambled to imitate observation data. Therefore, we have reason to suspect that some unrepeatable experimental data may be forged. The com quantum theory waveform shown in Figure 2 is drawn from 4000 sets of data. In order to compare the different waveforms of GW150914 waveform, Hanford waveform, Livingston waveform and numerical relativistic waveform are also drawn. The com quantum theory waveform in the high frequency band is consistent with the numerical relativistic waveform, while the phase difference in the low frequency band is very large. Because the numerical relativistic waveform of GW150914 waveform has no transparent drawing procedure, the fundamental reason for the difference between the two waveforms in the low frequency band cannot be found at present. LIGO's conclusion has always been lack of scientific reasoning, vague and reckless.

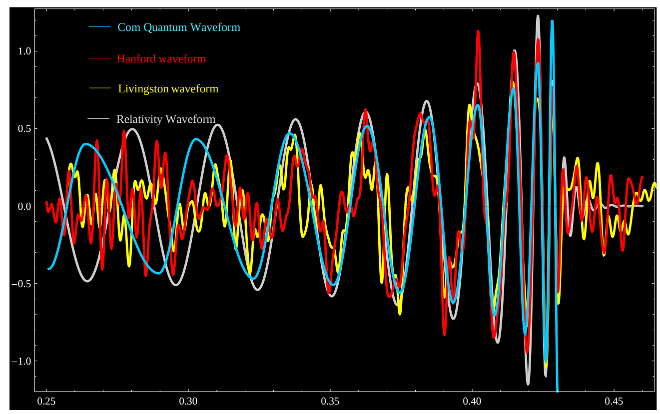

Figure 2 The Hanford vibration curve of the GW150914 waveform, the Livingston vibration curve, the LIGO relativistic wave and the standard waveform of com quantum theory..

The drawing of the com quantum waveform of the above GW150914 waveform has a clear numerical processing procedure. Drawing the com quantum waveform of the variable frequency signal wave, including modifying the strain time of GW150914 waveform to fit an applicable waveform function within the allowable range of error, requires determining the com quantization formula of frequency distribution of variable frequency signal wave. To different variable frequency signal wave of natural phenomena, any new effective numerical method will prompt the discovery of new discrete laws. Scientific conclusions should not be confined to qualitative descriptions. By trying to draw a numerical relativistic waveform of LIGO signal wave, we can infer the reason why the drawing procedure of so-called numerical relativistic waveform of GW150914 waveform is opaque. This is because drawing the numerical waveform requires the corresponding numerical equation rather than the original function of the expected waveform. In a word, the drawing of numerical theory waveform can greatly reduce the empty debate about opaque operation, and can also discover the precise rules hidden in the observed data in the process of improving the numerical calculation method.

4 Missing characteristic frequency of GW150914 waveform

The system of spiral binary stars is the simplest and most important model of the gravitational wave source. Modern gravitational theory holds that the merger of binary stars will undergo three processes: inspired, merger and ringdown. Various LIGO signal waves have been corrected to give waveforms that meet the theoretical expectations. However, from the main vibration part of various LIGO signal waves, only the strictly monotonic frequency of GW150914 waveform is most consistent with the characteristics of the gravitational wave of the spiral binary stars. According to the correct superposition curve of Hanford vibration curve and Livingston vibration curve shown in Figure 1, it is easy to find that the Hanford vibration curve of 0.43s∼0.47s does not coincide with the Livingston vibration curve after upside-down inversion and translation, and even some strain phases are opposite. This detail may imply important scientific reasons to be discovered. If we can't give a reasonable explanation for these questions and arbitrarily define GW150914 waveform as the gravitational wave of spiral binary black holes, it is obviously not a scientific conclusion.

Now let's discuss a more critical question. Even if the GW150914 waveform really comes from the gravitational wave radiation of merging spiral binary stars, the frequency of spiral binary stars' precession increases monotonously, and the frequency of the gravitational wave radiated by the binary stars also increases monotonously in the precession process. However, the frequency of binary stars' precession will not increase infinitely, so the gravitational wave of spiral binary stars must have a frequency limit, which is expressed by f_0. In this case, f_0 is the characteristic frequency of the gravitational wave of spiral binaries, that is, the connection frequency between precession process and oscillation process, which corresponds to a special pulse in the gravitational wave of spiral binaries. Whether this particular pulse exists indicates whether the spiral binaries have finally merged.

According to the definition of Lagrange frequency change rate $\dot{f}_n = (f_{n-1} - f_{n+1})/(T_n + T_{n-1})$[18, 27], the period is expressed by the corresponding frequency, and the relationship $\dot{f}_n = (f_{n-1} - f_{n+1}) f_{n-1} f_n (f_{n-1} + f_n)^{-1}$ is obtained. Although $\dot{f}_0$ has no meaning, $\dot{f}_1$ has the corresponding calculation results. So if $n = 1$ is taken, then f_0 is defined. Solving the equation $\dot{f}_1 = (f_0 - f_2) f_0 f_1 (f_0 + f_1)^{-1}$, the physical meaning of the root is,

$$f_0 = \frac{1}{2f_1}\left[f_1 f_2 + \dot{f}_1 + \sqrt{\left(f_1 f_2 + \dot{f}_1\right)^2 + 4f_1^2\dot{f}_1}\right] \tag{7}$$

Where $\dot{f}_1 = 1407 f_1^2/1160$ is given by the Lagrange frequency rate formula[?] of gravitational waves,

$$\dot{f}_n = \frac{(n+2)\ (4n+3)\ \left(6n^3 + 24n^2 + 28n + 9\right)}{n\,(n+1)\ (n+3)\ (2n+3)\ (8n^2 + 16n + 5)} f_n^2 \tag{8}$$

Then the values of $f_0^{\pm}$ can be obtained by calculating the frequencies of $f_1^{\pm}$ and $f_2^{\pm}$ in Table 1 respectively.

The frequencyrecurrence equation (3) can also be used to calculate the characteristic frequency $f_0^{\pm}$. The form of equation (3) is derived from the recurrence of high frequency and low frequency, which can be rewritten into the recurrence from high frequency to low frequency,

$$f_n = \frac{(n+3)\left(32n^2 + 120n + 111\right)}{(n+1)\left(32n^2 + 136n + 143\right)} f_{n+1} \tag{9}$$

Take $n = 0$ to obtain the iconic maximum frequency

$$f_0 = \frac{333}{143} f_1 \tag{10}$$

this formula is called Donfang characteristic frequency. If the gw15091 signal source is the merging spiral double star, the positive and negative pulse strain corresponding to the maximum frequency f_0 will be radiated during the merging process. The results calculated by the two methods are consistent, and the calculation by equation (3) is simpler. For GW150914 waveform, because $f_1^+ = 197.3975904\text{Hz}$, $f_1^- = 230.7600891\text{Hz}$, Therefore, the Dongfang characteristic frequencies of positive and negative strains are:

$$\begin{aligned} f_0^+ &= 459.674109113\text{Hz} \\ f_0^- &= 537.364403289\text{Hz} \end{aligned} \tag{11}$$

This indicates that at least the special pulse corresponding to the cohesion frequency $f_0^+ = 459.674109113\text{Hz}$ should be radiated during the spiral binary stars merging of GW150914 waveform sources.

The gravitational wave pulse corresponding to the characteristic frequency is the main sign of the merger of spiral binaries. However, there is no pulse corresponding to the characteristic frequency in the detection data of GW150914 waveform. LIGO claims that Hanford detector and Livingston detector synchronously detected the GW150914 waveform within 0.25 0.47s. So the problem is suddenly enlightened! In principle, it is impossible for the two detectors to consistently produce systematic errors, so that the special pulse marking the merger of binary stars after 0.43s disappears at the same time. So, does the data extraction template lead to the disappearance of characteristic frequency? Or the data extraction is correct, and the result just proves that the binaries of GW150914 waveform source have not realized the final merger, and the binaries of GW150914 waveform source are still in? The new problems caused by the failure of the final merger of binary stars are: will be the binary stars maintain a uniform circular motion or move away after reaching the nearest distance? What is the shape of the gravitational wave after the binary star reaches the nearest distance? Where was the binary star of GW150914 waveform later? It can be seen that LIGO absolutely wants to create all binary star merger events, otherwise the detector can repeatedly detect the subsequent situation, and all myths and stories will go through. Isn't this the real reason why all reports of LIGO claim that binaries have completed the merger? However, if the GW150914 waveform is defined as the gravitational wave of spiral binary stars, the merger of wave source binary stars has not been completed, which is completely contrary to the conclusion expected and announced by LIGO. Now let's look forward to LIGO's wonderful explanation.

The conclusion of human reasoning about ancient cosmic events is restricted by physical and logical tools. From GW150914 waveform to gw170817 signal, LIGO always gives highly repeated conclusions: the extracted signal wave is either the gravitational wave of the merger of binary black holes or the gravitational wave of the merger of binary neutron stars, which means that there seems to be a heyday of the merger of binary stars in the historical process of the evolution of the universe, its radiation information can be accurately captured by LIGO detector. If this is true, how to explain this special cosmic history? However, GW150914 waveform does follow a new quantum law, which contains enough logical propositions. It brings us many thought-provoking scientific and ethical problems, and will also promote the progress of physical theory and signal detection technology.

5 Conclusions and comments

Nature is always thrilling! Human's understanding of nature can be constantly improved, but the ability to understand nature is always limited. When scientific researchers can't complete their plans for a long time, they often make up fairy tales. As everyone knows, there is no flawless lie, people can often rack one's brains, use all sorts of intrigues and wiles to achieve their personal goals, but after all, human beings must be in awe of nature. The articles of the LIGO team follow the same pattern to announce that the two expensive detectors have continuously captured the remote and ancient binary star merger events, which is really very boring.

However, the detection of gravitational wave or simulated gravitational wave will promote theoretical physics to a new stage of development. Gravitational wave signal or simulated gravitational wave signal contains new physical information about com quantum theory and many scientific problems that need to be solved urgently. Spiral binary is the simplest model of spiral system. According to the detection data of spiral binary stars, the com quantized recurrence equation of radiation frequency can be fitted by the minimum solution method of characteristic Diophantine equation. From this, the quantum number corresponding to each frequency can be determined, and the characteristic frequency of binary star merging can also be calculated theoretically. The com quantum law of GW150914 waveform and the frequency recurrence equation of com quantization belong to the experimental law. The characteristic frequency of spiral binary stars, which is the only sign of a binary merger, is one of the necessary corollaries of the experimental law. However, there is no radiation pulse corresponding to the characteristic frequency of binary stars merging in the observed data of GW150914 waveform. Finding out the reason, whether the signal wave extraction template fails to include the peak marking the merger of spiral binaries, or whether the binaries may not achieve the final merger, the answer is not clear at present. As a gravitational wave, the final result of binary black holes with GW150914 waveform source needs further analysis and demonstration. If the GW150914 binary stars had did not merge, the detection of gravitational waves for the later period of GW150914 binary black holes constitutes a decisive experiment to test the theory of gravitational waves and the confidence of gravitational wave detectors.

Is there any possibility that the source of the GW150914 waveform is dense binary stars with smaller mass in the near space-time, or some other similar wave source? In fact, it is difficult for humans to truly understand the gravitational system of one billion or billions of light years away. Any qualitative conclusions about the cosmos in ancient-distant time and space eventually need to be examined by by in-depth calculation. As we all know, orbit and period of planets and so on, the classical gravitation theory describes these conclusions of the gravitational system accurately, and the application of classical gravity theory to aerospace engineering has also made brilliant achievements. Including the singular conclusions[33-37], such as black hole, some conclusions of modern physics still need to be tested by extensive formulaic experimental laws and logical demonstrations. The mathematical forms of different theories describing the same natural law may be totally different, but for the analysis of experimental detection data, their numerical results must be consistent within the error range. Studying the law of the fundamental characteristic physical quantity of gravitational waves such as the frequency and so on, an accurate theory must not depend on unproven assumptions. Its correct development is bound to be compatible with the achievements of classical physics and modern physics, especially to accept the test of formulaic exact experimental law.

Gravitational waves in general relativity are often described as spatiotemporal ripples, which make them very mysterious. In fact, the essence of gravitational waves is the manifestation forms of gravitational field changes caused by moving objects, so gravitational waves are ubiquitous, but it is usually difficult for gravitational waves to be detected by instruments. In the laboratory, the simulation spiral motion or other variable frequency motion can be achieved to obtain the corresponding gravitational waves. Since the universal gravitational constant G can be accurately measured in the laboratory, people are bound to be able to build similar sensors to detect gravitational waves in the laboratory. It is suggested that gravitational waves of spiral systems should be widely simulated in the laboratory. The observed results of gravitational waves in the laboratory are repeatable. The repeatable experimental results can be used to measure the confidence of gravitational waves detected by gravitational wave laser interferometer or other sensors. It is of great significance that the detection results of gravitational waves simulating spiral systems will be reliable experimental basis for testing different gravitational theories, and finally help us reveal the truth and falsity of the gravitational wave of the spiral black hole.

It is also a challenge to identify the signal waves when modern high-speed locomotives start, and the mystery will eventually be solved.

[1] Abbott, B. P. *et al.* Observation of gravitational waves from a binary black hole merger. *Physical review letters* **116**, 061102 (2016).
[2] Einstein, A. Näherungweise Integration der Feldgleichungen der Gravitation,*Sitzungsber. K. Preuss. Akad. Wiss.* **1**, 688 (1916).
[3] Einstein, A. Über Gravitationswellen,*Sitzungsber. K. Preuss. Akad. Wiss.* **1**, 154 (1918).
[4] Einstein, A. & Rosen, N. On gravitational waves. *Journal of the Franklin Institute* **223**, 43-54 (1937).
[5] Dongfang, X. D. On the Relativity of the Speed of Light. *Mathematics & Nature* 1, 202101 (2021).
[6] Dongfang, X. D. Dongfang Com Quantum Equations for LIGO Signal. Mathematics & Nature, 1, 202106 (2021).
[7] Scientific, L. *et al.* GW170104: observation of a 50-solar-mass binary black hole coalescence at redshift 0.2. *Physical Review Letters* **118**, 221101 (2017).
[8] Abbott, B. P. *et al.* GW170814: A three-detector observation of gravitational waves from a binary black hole coalescence. *Physical Review Letters* **119**, 141101 (2017).
[9] Abbott, B. P. *et al.* GW170817: observation of gravitational waves from a binary neutron star inspiral. *Physical Review Letters* **119**, 161101 (2017)
[10] Abbott, B. *et al.* GW151226: Observation of gravitational waves from a 22-solar-mass binary black hole coalescence. *Physical Review Letters* **116**, 241103 (2016).
[11] Shibata, M. & Nakamura, T. Evolution of three-dimensional gravitational waves: Harmonic slicing case. *Physical Review D* **52**, 5428 (1995).
[12] Buonanno, A., Cook, G. B. & Pretorius, F. Inspiral, merger, and ring-down of equal-mass black-hole binaries. *Physical Review D* **75**, 124018 (2007).
[13] Damour, T., Nagar, A., Hannam, M., Husa, S. & Brügmann, B. Accurate effective-one-body waveforms of inspiralling and coalescing black-hole binaries. *Physical Review D* **78**, 044039 (2008).
[14] Ohme, F. Analytical meets numerical relativity: status of complete gravitational waveform models for binary black holes. *Classical and Quantum Gravity* **29**, 124002 (2012).
[15] Centrella, J., Baker, J. G., Kelly, B. J. & van Meter, J. R. Black-hole binaries, gravitational waves, and numerical relativity. *Reviews of Modern Physics* **82**, 3069 (2010).
[16] Cutler, C. & Flanagan, E. E. Gravitational waves from merging compact binaries: How accurately can one extract the binary's parameters from the inspiral waveform? *Physical Review D* **49**, 2658 (1994).
[17] Blanchet, L., Damour, T., Iyer, B. R., Will, C. M. & Wiseman, A. G. Gravitational-radiation damping of compact binary systems to second post-Newtonian order. *Physical Review Letters* **74**, 3515 (1995).
[18] Dongfang, X. D. Relativistic Equation Failure for LIGO Signals. *Mathematics & Nature* 1, 202103 (2021).
[19] Landau, L. D. & Lifshitz, E. *Course of Theoretical Physics Vol 3 Quantum Mechanics.* (Pergamon Press, 1958).
[20] Schiff, L. I. Quantum Mechanics 3rd. *New York: M cGraw-Hill*, 61-62 (1968).
[21] Baym, G. & Benjamm, W. Lectures on Quantum Mechanics. (1969).
[22] Dirac, P. A. M. *The principles of quantum mechanics.* (Oxford university press, 1981).
[23] Eisberg, R. M., Eisberg, R. M. & Eisberg, R. M. Quantum physics of atoms, molecules, solids, nuclei, and particles. (1985).
[24] Greiner, W. *Relativistic quantum mechanics.* Vol. 3 (Springer, 1990).
[25] Griffiths, D. J. & Schroeter, D. F. *Introduction to quantum mechanics.* (Cambridge University Press, 2018).
[26] Dongfang, X. D. The Morbid Equation of Quantum Numbers. *Mathematics & Nature* **1**, 202102 (2021).
[27] Dongfang, X. D. Dongfang Angular Motion Law and Operator Equations. *Mathematics & Nature* **1**, 202105 (2021).
[28] Abbott, B. P. *et al.* Observation of gravitational waves from a binary black hole merger. *Physical review letters* **116**, 061102 (2016).
[29] Hua, L. G. Introduction to number theory. *Sci. Press, Beijing, China. pp*, 301-333 (1979).
[30] Rosen, K. H. *Elementary number theory and its applications.* (Addison-Wesley, 1993).
[31] Contejean, E. & Devie, H. An efficient incremental algorithm for solving systems of linear Diophantine equations. *Information and computation* **113**, 143-172 (1994).
[32] Brualdi, R. A. *Introductory combinatorics.* (Pearson Education India, 2004).
[33] Sanchez, N. Absorption and emission spectra of a Schwarzschild black hole. *Physical Review D* **18**,1030 (1978).
[34] Ashtekar, A. & Bojowald, M. Quantum geometry and the Schwarzschild singularity. *Classical and Quantum Gravity* **23**, 391 (2005).
[35] Hawking, S. W. Black holes in general relativity. *Communications in Mathematical Physics* **25**, 152-166 (1972).
[36] Schwarzschild, K. Über das Gravitationsfeld einer Kugel aus inkompressibler Flüssigkeit nach der Einsteinschen Theoriey. *Sitzungsber. K. Preuss. Akad. Wiss.* **1**, 189 (1916).
[37] Kerr, R. P. Gravitational field of a spinning mass as an example of algebraically special metrics. *Physical review letters* **11**, 237 (1963).