# Is the Speed of Light a 3$^{rd}$ Harmonic Wave?

**Greg Poole**

Industrial Tests, Inc. Rocklin, CA, USA

**Abstract**   Schumann Resonant currents are known to exist in the Earth's cavity. By representing these resonant currents throughout the inner Earth, it is shown through string wave calculations that tension exists between the center of the Earth and the surface of the Earth. Using known facts of the Earth it is possible to calculate Schumann resonance or conversely, insert measured resonance values and calculate tension. The known parameters and the measured values of resonance suggest that there exists wave tension, which acts as an electromechanical connection or "string" between the center of the Earth and all things on the surface of the Earth. It is concluded that naturally occurring Extremely Low Frequency waves penetrate everything living and nonliving on the Earth, thus providing a resonant connection which creates tension, more commonly referred to as gravity (g). Curiously, calculations indicate that the speed of light may be a 3$^{rd}$ harmonic of 1 x $10^8$ m/s.

**Keywords**   3$^{rd}$ Harmonic, Extremely Low Frequency, Gravity, Schumann Resonance, String Wave

## 1. Introduction

Historically it has been thought that Schumann resonances occurs because the space between the surface of the Earth and the conductive ionosphere acts as a closed waveguide. My previous work in modeling the electrical Earth indicated that extremely low frequency (ELF) electrical currents are emanating and flowing through the Earth's core and mantle [1]. The currents through, in and around the Earth are all thought to operate at Schumann Resonance. Schumann resonances are the principal currents of the Earth and generate the electromagnetic spectrum from 3 Hz through 60 Hz and appear as distinct peaks at around 7.83 Hz (fundamental). The various even and odd harmonic currents are major contributors, and it is thought that the primary current flow throughout the Earth is a third harmonic. The graph below (Figure 1) shows that the 3$^{rd}$ harmonic, 23.5Hz, has a higher magnitude and thus a dominant signature on the Earth.

The Extremely Low Frequency (ELF) current have a unique property in that they can penetrate through the Earth and through water. As such, ELF has been used extensively in military applications, primarily submarine communications. Work is currently underway in Milford, Texas where low frequency power will be transmitted over the surface of the Earth in sufficient magnitude to someday replace transmission towers, wires and cables [2] [3]. This recent construction is a direct result of the rediscovery of research and testing in the field of propagating surface waves, or Zaneck waves, circa. 1936 [4] [5] [6].

Though current research is centered around surface waves, it is my belief that low-level currents flow in and around all living and nonliving bodies on the surface of the planet and everything is thus electrically connected through penetrating extremely low frequency currents. Nickola Tesla reported electrical currents traveling and reflecting through the Earth as result of lightning strikes in his Colorado Springs notebook in the year 1899. Tesla's stated goal was to transmit electrical power through the Earth itself, which he viewed as a lossless conductor [7]. Resonant electrical currents are natural to our environment and thus considered relatively harmless.

## 2. Wave Velocity in a String

The velocity of a traveling wave in a string is determined by the tension and the mass per unit length of the string. When the wave relationship is applied to a stretched string, it is seen that resonant standing wave modes are produced. The lowest frequency mode for a stretched string is called the fundamental, and its frequency is given by:

$$f_1 = \frac{\sqrt{\frac{T}{m/L}}}{2L} \tag{8}$$

Where
T= string tension
m= string mass
L= string length

* Corresponding author:
greg@indtest.com (Greg Poole)

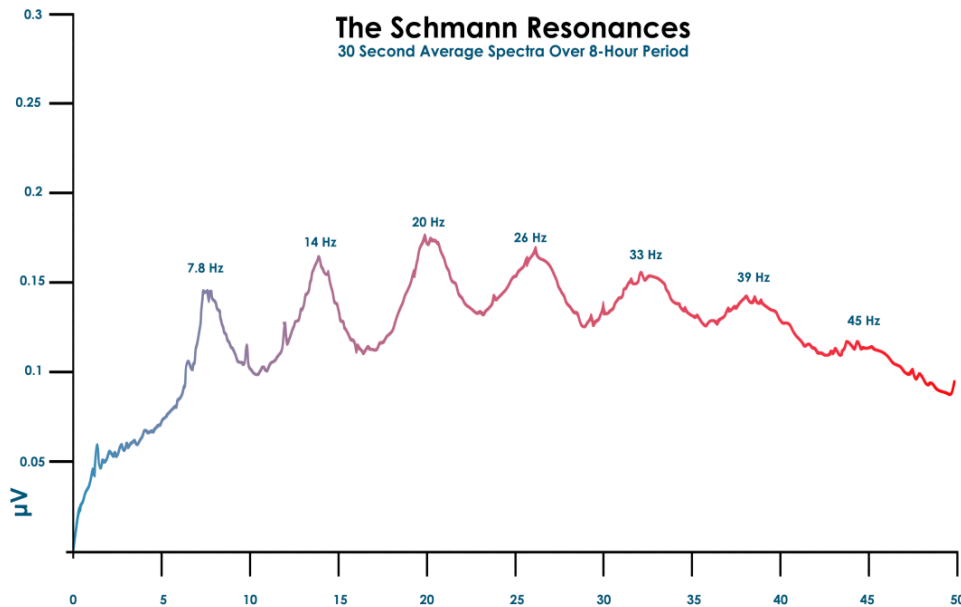The Schumann Resonances
30 Second Average Spectra Over 8-Hour Period

**Figure 1.**   Schumann Resonances

## 3. Calculating Schumann Resonance Fundamental

Using $1/3^{rd}$ the speed of light, gravity of Earth and its radius,

Velocity c $= 1 \times 10^8$ m/s

$T = $ Gravity of the Earth $= 9.8$ N $= 2.204$lbs

$L = Radius\ of\ the\ Earth = 6,378,000\ meters$

$\dfrac{m}{L} = 9.803 \times 10^{-13} g/m$

The following number is then calculated,

$f = 7.839\ Hz$

## 4. Calculating Schumann Resonance 2<sup>nd</sup> Harmonic

Using $2/3^{rd}$ the speed of light, gravity of the Earth and its radius,

Velocity c $= 2 \times 10^8$ m/s

$T = $ Gravity of the Earth $= 9.8$ N $= 2.204$lbs

$L = Radius\ of\ Earth = 6,378,000\ meters$

$\dfrac{m}{L} = 2.45 \times 10^{-13} g/m$

The following number is then calculated,

$f = 15.678\ Hz$

## 5. Calculating Schumann Resonance 3<sup>rd</sup> Harmonic

Using speed of light, gravity of the Earth and its radius,

Velocity c $= 3 \times 10^8$ m/s

$T = $ Gravity of the Earth $= 9.8$ N $= 2.204$lbs

$L = Radius\ of\ Earth = 6,378,000\ meters$

$\dfrac{m}{L} = 1.089 \times 10^{-13}\ g/m$

The following number is then calculated,

$f = 23.513\ Hz$

## 6. Calculating Gravity of the Earth

Using speed of light, Schumann Resonance 3rd Harmonic and Radius,

Velocity c $= 3 \times 10^8$ m/s

$L = Radius\ of\ the\ Earth = 6,378,000\ meters$

$f = 23.518\ Hz$

$\dfrac{m}{L} = 1.089 \times 10^{-13} g/m$

The following number is then calculated,

$T = $ Gravity of the Earth $= 9.8$ N $= 2.204$lbs

## 7. Calculating Gravity of 200lb Object

Using speed of light, radius of Earth, $3^{rd}$ Harmonic

Velocity c $= 3 \times 10^8$ m/s

$L = Radius\ of\ Earth = 6,378,000\ meters$

$f = 23.53\ Hz$

$\dfrac{m}{L} = 1.0e - 11\ g/m$

The following number is then calculated,

$T = \text{Gravity Earth} = 900\,N = 202.3\,lbs$

## 8. Earth Near Field Calculation

The theory of electro relativity provides a correlation between gravity and the three electromagnetic fields that comprise the earth – far field, near field and magnetoquasistatic field. [9] The near field resembles a short coil antenna that resonates a wavelength and a frequency. Using the gravity field equation for the near field I calculate frequency for various near impedance values near the antenna or surface of the earth.

$g = Gc^3/2\pi r^2$
Insert $(Z_w \times C)^2$ for $r^2$
$g = Gc^3/2\pi (Z_w \times C)^2$

Insert Near Field Impedance $Z_w = 2370\, r / \lambda$ for a short coil antenna

$g = Gc^3/2\pi (2370r/\lambda \times C)^2$
$g = Gc^3\lambda^2 C^2/2\pi 2370^2 r^2$
$\lambda = \text{Square Root } 2\pi g\, 2370^2\, r^2/Gc^3C^2$
Inserting $r = 6378000$, $c = 3e8$, $C = .00071F$, $g = 9.8$
$\lambda = 3935523$
$f = c / \lambda = 76\,Hz$

2370 relates to the impedance at a distance of .159 wavelength. The closer we get to the antenna or surface of the earth the higher the impedance. Closer to the surface of the $Z_w$ approaches 7700 ohms, which changes the equations to,

$\lambda = \text{Square Root } 2\pi g\, 7700^2\, r^2/Gc^3C^2$
Inserting $r = 6378000$, $c = 3e8$, $C = .00071F$, $g = 9.8$
$\lambda = 12768316$
$f = c / \lambda = 23.5\,Hz$
$\tau = RC$
$\tau = 7700\, r / \lambda \times .00071$
$\tau = 7700 \times 6378000 / 12768316 \times .00071$
$\tau = 7700 \times 5 \times .00071$
$\tau = 7700\,\text{ohms} \times .00071\,F$
$\tau = 2.73$

Approaching the surface even closer the impedance rises to $Z_w = 23000$ ohms

$\lambda = \text{Square Root } 2\pi g\, 23000^2\, r^2/Gc^3C^2$
Inserting $r = 6378000$, $c = 3e8$, $C = .00071F$, $g = 9.8$
$\lambda = 38192843$
$f = c / \lambda = 7.85\,Hz$

The calculation above indicate the 23.5 Hz most closely matches the diameter of the earth, which is 1,275,000. They are within 1% of each other. The frequency of 76 Hz does not align as closely with the earth outer core which is thought to be 4,540,000 km radius. The wavelength for 7.83 Hz is almost exactly 3X length of that of 23.5 Hz. The altitude from the earth in which this frequency operates concurs with the historical theory that Schumann resonance occurs because the space between the surface of the Earth and the conductive ionosphere acts as a closed waveguide.

In 1902 Heaviside and Kennelly first suggested that an ionosphere capable of trapping electromagnetic waves existed. [10] [11] In 1925 Edward Appleton and Barnett were able to prove by experimentation that the ionosphere existed. [12]

G. N. Watson in 1918 created the mathematical tools for dealing with spherical waveguides. [13] In 1952 Winfried Otto Schumann first studied the theoretical aspects of the global resonances of the earth ionosphere waveguide system, known today as the Schumann resonances. [14] [15] [16] [17]

## 9. Conclusions

Schumann Resonance is a known electrical phenomenon, which I have long expanded to include the inner currents operating in the mantle and iron core of the Earth. Nickola Tesla proposed a similar fundamental frequency of 8 Hz in 1906 with his patents for Wardenclyffe Tower [19]. A more modern wireless transmission tower has been constructed this year in Milford, Texas and is planned to have an operating frequency in the 18 kHz for propagating surface waves. Though Tesla's patents are not cited in the work of this company, the tower design appears similar to the Wardenclyffe Tower based on what I observed while visiting this year. The challenge in low frequency power propagation and communication is the physical length of the antenna.

In my opinion the Earth acts as its own wireless power transmitter and emits extremely low frequencies that penetrate and surround anything and everything on the surface of the Earth. Flux transfer events' frequencies operate in the range of 0.002 Hz, which penetrate to the inner core of the Earth. As such it is theorized that Schumann resonant frequency currents connect all living and non-living bodies on the planet. There is thus Tension created between all things and the centre of the Earth where the power generating the centre of the Earth is located. We are electrically and mechanically drawn to the centre of the Earth and to everything through Tension similar to a string under tension. Using the speed of light and the radius of the Earth in a conventional wave string calculator, I have confirmed that Schumann Resonance is the natural frequency that all things have in common and through which they operate. Wave string theory is typically used for mechanical devices that I have adapted to a larger planetary scale. I have demonstrated that it can cross over to electrical theory and implies that the Earth acts electromechanically by creating Tension from known electrical resonances. It is thus concluded that gravity is a Tension created by electrical currents operating at Schumann Resonance and known harmonics. The speed of light is typically associated with the flow of electricity, and it correlates with the dominant 3rd Schumann harmonic. Tension is thus created between persons and things that are within the electromagnetic field of the Earth. Gravity is concluded to be directly related to Schumann's Resonance.

The string wave equation is somewhat forgiving, but the parameters through which the Earth operates are fixed. The radius we know is 6,378km. Change the frequency and the model can change the length of the radius, which we know is not physically possible. The length also factors into the unit m/L which inversely impacts tension. Frequency is proportional to the speed of light which we know from measured data aligns with resonance on the 3$^{rd}$ harmonic for maximum amplitude. The string wave equation does an excellent job of representing the resonant condition of the Earth and the result obtained is as expected and quite accurate.

What the string wave calculator tells us is that resonant frequency requires tension, length or radius, and string mass. Schumann Resonance is a known quantity as is the Earth's radius, and gravity or tension. There is no ambiguity in these three known inputs to the equation. String mass is the only unknown variable and it has been represented as an electromechanical "string" connection between everything on the Earth's surface to the centre point of the Earth. The calculation is straightforward and within reason. Everything effectively resonates with the Earth and is held together by tension.

The results also imply that light, or $c$, is a 3$^{rd}$ harmonic wave with a fundamental speed of 1 x10$^{8}$ m/s. There also appears to be a second harmonic speed of light. This is an interesting finding if true. More research is needed to prove or disprove this new theory of light representing a 3$^{rd}$ harmonic speed wave. The data may be coincidental or there may be another explanation yet to be unravelled.

# ACKNOWLEDGEMENTS

# REFERENCES

[1] Poole, G. (2018) Cosmic Wireless Power Transfer System and the Equation for Everything $E=mc^2=vc^2/60=a^3/T=G(M_1+M_2)/4\pi^2=(KE+PE)/1.0E15=Q=PA/F=\lambda/hc=1/2q=VI=1/2LI^2=1/2CV=I^2R =\ldots$ *Journal of High Energy Physics, Gravitation and Cosmology*, 4, 588-650. doi: 10.4236/jhepgc.2018.44036.

[2] Major General Richard T. Devereaux, USAF (Ret.), (2017) THE MICROGRID UNPLUGGED: ENERGY SURETY VIA WIRELESS POWER, Paper presented at Association of Energy Engineers.

[3] K.L. Corum, Brigadier General (Ret.) M.W. Miller, Ph.D, J.F. Corum, Ph.D, (2016) Surface Waves and the Crucial Propagation Experiment, Texas Symposium on Wireless& Mircowave Circuits& Systems, IEEE Microwave Theory and Techniques Society, Baylor University, Waco Texas.

[4] Norton, K.A., "Propagation of Radio Waves Over a Plane Earth," Nature, vol. 135, June 8, 1935, pp. 934-935.

[5] Burrows, C.R., "Existence of a Surface Wave in Radio Propagation, Nature, vol. 138, August 15, 1936, p. 284. 5 Burrows, C.R., "The Surface Wave in Radio Propagation Over Plane Earth," Proceedings of the IRE, vol. 25, No. 2, February 1937, pp. 219-229. (See Figure 3.)

[6] Wait, J.R., "Electromagnetic Surface Waves," published in Advances in Radio Research, J. A. Saxton, editor, Academic Press, 1964, Vol. 1, pp. 157-217. "Corrections," Radio Science, vol. 69D, No. 7, 1965, pp. 969-975.

[7] Nikola Tesla, 1899-1900, Colorado Springs Notes, ISBN-13: 978-8087888247, ISBN-10: 8087888243.

[8] Tamer Bécherrawy, Mechanical and Electromagnetic Vibrations and Waves (2012), John Wiley & Sons, ISBN 978—1-84821-293-1.

[9] Poole, G. (2019) Theory of Electro Relativity. *Journal of High Energy Physics, Gravitation and Cosmology*, 5, 1063-1067. doi: 10.4236/jhepgc.2019.54059.

[10] Heaviside, O. (1902). "Telegraphy, Sect. 1, Theory". *Encyclopædia Britannica*. 9 (10 ed.). London. pp. 213–218.

[11] Kennelly, A. E. (1902). "On the elevation of the electrically-conducting strata of the earth's atmosphere". *World and Engineer*. 32: 473.

[12] Appleton, E. V.; Barnett, M. A. F. (1925). "On Some Direct Evidence for Downward Atmospheric Reflection of Electric Rays". *Proceedings of the Royal Society of London A*. 109 (752): 621–641. Bibcode: 1925RSPSA.109..621A. doi:10.1098/rspa.1925.0149.

[13] Watson, G. N. (1918). "The diffraction of electric waves by the Earth". *Proceedings of the Royal Society of London A*. 95 (666): 83–99. Bibcode:1918RSPSA..95...83W. doi:10.1098/rspa.1918.0050.

[14] Schumann, W. O. (1952). "Über die strahlungslosen Eigenschwingungen einer leitenden Kugel, die von einer Luftschicht und einer Ionosphärenhülle umgeben ist". *Zeitschrift für Naturforschung A*. 7 (2): 149–154. Bibcode: 1952ZNatA...7..149S. doi:10.1515/zna-1952-0202.

[15] Schumann, W. O. (1952). "Über die Dämpfung der elektromagnetischen Eigenschwingnugen des Systems Erde – Luft – Ionosphäre". *Zeitschrift für Naturforschung A*. 7 (3–4): 250–252. Bibcode: 1952 ZNatA...7..250S. doi:10.1515/zna-1952-3-404.

[16] Schumann, W. O. (1952). "Über die Ausbreitung sehr Langer elektriseher Wellen um die Signale des Blitzes". *Nuovo

*Cimento*. 9 (12): 1116–1138. Bibcode: 1952NCim....9.1116S. doi:10.1007/BF02782924.

[17] Schumann, W. O.; König, H. (1954). "Ü ber die Beobactung von Atmospherics bei geringsten Frequenzen".

*Naturwissenschaften*. 41 (8): 183–184. Bibcode: 1954NW.....41.. 183S. doi:10.1007/BF00638174.

[18] Nikola Tesla, Apparatus for Transmitting Electrical Power, (1907) US Patent US1119732A.