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Gayatri as Iso-Red-Shift of Astrophysical Event

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ABSTRACT

The Gayatri, according to Vedas the ancient Indian philosophical scriptures, is a goddess deity that depicts Omni present AUM phenomena throughout day-night cycle is referred to as a Vedic meter to monitor and regulate the interaction process between sunlight and earth in 8 directions of the sky. Gayatri refers to two metaphysical aspects, such as cosmic energy or “Prana”, as well as, Sun rise-Noon-Sun set astrophysical events on complex matter-energy interaction. The recitation of Gayatri is believed to enhance a human individual’s bio-energy required for attaining sound physical mental health. Since, the essence of energies (Self) of Sun and living beings are common, therefore, effect of interaction of physical light with living beings and recitation effect of Gayatri by living beings are also the same (Taimne, 1974). The Gayatri is proposed as Iso-Red Shift (IRS) astrophysical event of the Sun rays directly reaching earth, as per Santillis’ findings that the redness of Sun in Sun rise and Sun set absorption is not the basis of sun redness, as air absorbs red wavelength sunlight spectrum. It is due to iso-red shift, with a spectral shift of 55 nm wavelength between yellow and red colors, 47 nm shift when Sun (blue) at zenith to red Sun and further extends to 200 nm at infrared range through Doppler Effect. It is analogous to shift in sound frequency of a moving source detected by the static observer. The Sun rise and Sun set of Gayatri events exhibit Red wavelength Doppler Shift with maximum polarized sky light. The noon phase has Blue wavelength Doppler Shift with least polarized sky light. The IRS on-set time depends upon earth’s axis rotation, axial tilt and twilight duration varying upon aphelion and perihelion distances of earth from the Sun. The Rayleigh scattering of light rays contributes to polarized sky light intensities proportional to inverse fourth power of the scattered wavelength. The study concludes that Gayatri phenomenon is a universal celestial IRS astrophysical event.

Keywords: Gayatri, IRS, Doppler Effect, Rayleigh Scattering & Polarized skylight

Introduction

The “Gayatri” as a physical event involves an interaction of the Earth and the Sun. It addresses two aspects regarding physical phenomena of Gayatri induces wavelength shift in sun rays at Sunrise, Noon and Sunset as basis of scriptural description of physical attributes of Gayatri such as: A. Color variation in Gayatri and recitation of the letters of Gayatri represents the above said attributes, that may have some effect on mind and

body with reference to Sun light reaching the earth during Sunrise, noon and Sunset phases and also co-relation of spiritual light shining within physical Sun also shines within the heart of every individuals [1]. B. Huge kinetic energy is required to derive the rotation of earth on its axis, so as to induct day-night cycle activity of the planet that influences the sky color variations. The present study attempts to understand the astrophysics of Gayatri phenomenon which could be co-related with the physical event of Gayatri during the Sunrise, Sunset and noon phases, in the light of modern astrophysical understanding, it appears that the scriptural description also point out to the changing color of Sun during different phases of Gayatri, such as a). Stars still shine even in refulgent Redness of rising Sun b). Azure - colored appearance. c).

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Twilight of sky light shifting from blue to White and mild intensity Sun's redness during Sunset phase [1]. All the above three description refers physical significance of Gayatri to Sunrise, noon and Sunset.

According to the ancient Indian tradition as described in the Sanskrit language, the Gayatri is a feminine form of word Gayatri as per physical description [1] meaning Gayatri as a song or hymn (The word Gayatri is derived from gAyantam-trAyate (gAyat+tra +ka +yangip); gaya that which is sung, given in praise, trayate (root trai) that which preserves/protects/gives deliverance/grants liberation having a Vedic meter of three padas (lines of stanza) mentioned in Rig-Veda, 62nd mantra 2

वरैरायं भूर्गो देवस्य धीमहि । धियो यो नः प्रचोदयात् ॥

Om bhūr bhuvah̄ svaḥ tāt savitūr vāreṇyaṃ bhārgo devāsya dhīmahi, dhiyo yó naḥ pracodáyat 3

in the tenth Sūkta of the third Mandala (Yajurveda-22/9, 30/2,36/3; Samveda 1/4/62) or eight syllables, in particular, refer to the Gayatri which has been personified as Hindu goddess Gayatri. The physical description of Gayatri described as having five heads with the ten eyes looking in the eight directions or syllables, as well as, the earth and sky [3] traditional texts point out the origin of Gayatri. In Chandogya Upanishad, verse II (23)-3 and verse IV (17) -3 refer to the metaphysical world. Physical description regarding interaction of Sunlight on earth through sky or space defined as "Suvah" and is mentioned in Gayatri Mantra [4,5], as well as the propagation of Sun light in all directions of space and the three Padas (Yajurveda-22/9, 30/2,36/3; Samveda 1/4/62) may be plausibly taken to refer to continuous three transitional events of earth-sun light interaction through the sky (ether), namely, Sunrise, Sunset and noon phases.

The Gayatri is proposed as an expansion of AUM and also as the eternal sound emanating at the time of creation could be akin to Big-Bang concept of the origin of universe [2]. Therefore, scientifically, the concept of Gayatri may be explained as a complex astrophysical celestial phenomenon involving the interaction of visible spectrum frequencies of the Sun rays interacting with the earth. This interaction of the Sun rays spectrum exhibits two types of color dominance. They are: 1). Redness of the Sun and red sky twilight phases before Sun rise and after Sunset. 2). Blue color sky (Whitish Sun) at noon as described in literature [1]. Similar description about the changing sky light color in Sunrise, Sun-set and noon is evident in Gayatri as mentioned in traditional texts [6,7].

Since, the Gayatri phenomenon is attributed to sky light of two dominant visible colors of Sun rays, namely Red and Blue sky colors, it needs an appropriate scientific reasoning to understand its physical event. The traditional description of the physical event of Gayatri has three temporal phases at any given time, within the day light period across the globe with reference to apparent shift of the Sun's position in the sky. The

scriptural description of 24 padas as described in GayatriKavacha [8] suggests Gayatri event is happening once day (24 hours of a day-night cycle) at any given point time and location on earth and each letter or word in mantra is in conjunction with the light in different phases of Sun light between the period of dusk to dawn. Since, entire day light has many phases. Hence, Gayatri varies upon the latitude and longitude of earth such that time interval among three main Gayatri phases such as Sunrise, noon and Sunset remain constant. It is determined by the earth's axis rotation in a half cycle (approximately 12 hours) out of 24 hours a day. It covers Sun rise and Sun set, as well as, noon phases. This celestial phenomenon could be explained as a result of interaction of Sun light with earth's angular rotation on its own axis and its mass [9,10]. The term Gayatri is traditionally symbolized as three dominant celestial colors that seem to appear in three different time zones of the day light period [1].

Gayatri: An Iso-Red-Shift event of Doppler Effect

According to the astronomical view the Gayatri is different from the phenomenon of Twilight Sky, wherein, it is mostly understood as sky illumined sky for a brief period before the Sunrise and after the Sunset. The Gayatri phenomenon involves interaction of the Sun's radiation propagating through space towards earth. The Sun's visible white light is composed of seven colors namely violet, indigo, blue, green, yellow, orange and red (VIBGYOR), as per frequency and wavelength range. It is recalled that the violet has highest frequency and a shortest wavelength and red color is having least frequency with a long wave length [11]. As the Earth moves towards or away from the Sun, as a result of its angular motion on its own axis, there will be a shift in Sun light spectrum by the observer, similar to the change in sound frequency received by the moving observer [12].

This could be attributed to the "Doppler effect" [13]. The complex interaction of Sun light rays in conjunction with the earth's angular moment precession or mass (angular), rotation on its own axis, may exhibit Doppler effect is attributed to Earth's rotation [14]. The same is inferred from earlier study revealing approximate Doppler shift of $1.6 \times 10^{-6} \text{m/s}$ at the equator [15]. The direct arrival of Redness of Sun rays is as a result of earth's axis rotation is due to Iso-Red-Shift (IRS) of Sun light spectrum through Doppler effect [15,16] that shifts from yellow to red at 55nm, at zenith from blue to red, and further towards infrared up to 200 nm wavelength [15]. The same spectra at zenith and at bottom on electronic scale showed a shift of 47 nm [13]. However, the observed shift is not due to Rayleigh absorption [15,17, 18].

The phase-wise events of Gayatri and the redness of Sun, according to the IRS can be attributed to the interaction of Sunlight with ether through Earth's atmosphere in such a way

that the air medium comprising the inert gases such as nitrogen, etc., could behave as Low-Pass Color-Filter [19] on the celestial plane. It is mostly as a result of Doppler-Filter mechanism to allow red color having low frequency and longer wavelength with maximum polarized skylight [20]. The Sun at noon, the ether appears as bluish sky due to Sun light passing through the atmosphere over a distance on the earth and facilitates propagation of high frequency and short wavelength of violet and blue colors with least random polarization of skylight [20]. Therefore, the interaction of Sun light with ether through earth's atmosphere may behave as High Pass Color Filter [19] on celestial plane with less polarized sky light [20]. Therefore, the shift in Sunlight color frequencies from red-to-blue-to-red spectrum with reference to earth's position in ether is understood as Gayatri. This aspect of Doppler effect of Gayatri on the earth is also evidenced from the Moon's image photographed in total lunar eclipse event that appears as red-orange, referred to as "blood Moon", represents Sun rise and Sun set events of the earth [21]. It further suggests the plausible occurrence of simultaneous Sun-rise and Sun-set could be attributed to IRS events through Doppler Effect [15,16] occurring on the earth's sky.

The Doppler effect led IRS event on-set time with reference to the rate of Earth's rotation could be an account of several geophysical parameters such as angular velocity of planets (spinning on its axis), axial tilt of the earth at 23.40 [22,23] as well as distances at aphelion and perihelion positions of earth from the Sun [24], determines the length and duration of Earth-Sun light interaction. However, the perihelion and aphelion positions of Earth from the Sun could influence red and blue Doppler shift effects as indicated from a study [25].

The same observation could also be evident from the Analemma, a phenomenon described as the tracing of the path of Sun's location in the celestial sphere (sky) over an entire year, resulting in the cyclic manner of path of the Sun's location that appear as a pattern similar to figure of eight or "8" [26]. The upper vertical portion of the pattern of figure 8 represents the path of the Sun traced in summer season and the lower vertical portion of figure 8 pattern refers to the path of the Sun traced in winter season [26].

Rayleigh Scattering: Twilight Sky Light Intensity and Noon Phase

The term "bhava" as mentioned in Gayatri mantra infers atmosphere of the Earth [2] and further it infers propagation of the Sun light through the atmosphere. It may infer the propagation of the Sun light, through the atmosphere by the Rayleigh scattering process, to modulate Sky light intensities in Twilight and Noon phases by Rayleigh scattering dealing with intensity aspect but not the frequency aspect of Doppler Effect led IRS spectral shift [27].

Hence, the Rayleigh scattering of specific wavelength of Sun

light color in the atmosphere enhances the intensity of scattered wavelength [27]. and also enhances in several folds larger than IRS of Doppler effect (45-100nm) spectral shift [15]. The intensity due to Rayleigh scattering is the sum of the square of amplitude of each particle [28] and is proportional to inverse fourth power of the wavelength of scattered light [29,30]. Therefore, the blue light scatters intensely than the red wavelength light [31].

The present scientific explanation for intensity of redness of the Sun in twilight is understood partly as a result of Rayleigh scattering process [32], wherein, the blue waves scatter intensely [31] and often absorbed by the molecules of thick air layer [33,34]. Besides, the relative distance of Sun light traversing through the earth atmosphere layer is 12 times longer during Sun rise and Sun set than at noon phase [35].

This also would contribute to variations in the scattered Sun light intensity. However, the Rayleigh scattering phenomena may also not explain the observed consistency of minimum reddishness of the Sun contributed by IRS event throughout the year. It would rather would vary the intensity due to fluctuating density of varied composition of atmospheric gas molecules, temperature, humidity, altitude, dust particles, weather, seasons [36] as well as, day light duration, pollutants, etc., [35] and scattering of Sun rays due to Earth's rotation [37]. Here, the Doppler Effect led IRS event precedes the Rayleigh scattering. Other factors that vary the onset timing of Gayatri event are attributed to Earth's rotation on its own axis [38,39], Doppler effect by the Earth's axis rotation [14] and gravitational field [40, 41].

Therefore, it leads to transverse Doppler effect as per Einstein's Special Theory of Relativity [42]. This observation remains unnoticed, since the emitted frequency of moving object would be reduced by the Lorentz factor, so that the received frequency is also reduced by the same factor [43]. As a result, the frequency response received by the observer (occipital lobe as cortical region of higher brain), responsible for processing visual information [44], would also get reduced by the similar magnitude of Lorentz factor as the observer moves away from the luminous (sun) object. Therefore, the plausible appearance of shifting suns' position with reference observer could be orientation of sun light rays reaching observer may be due to the predicted ocular tension and a component that vary twice the frequency of body tilt with respect to orientation of the body, gravity and the surrounding visual world [45]. Thus, the observed Doppler Effect has a reduced Lorentz factor that might contribute to perceived apparent motion of the Sun as seen from the Earth.

The generalized formula of Doppler equation:

Doppler Shift $D =$ [46].

Here, the variables of equation could be as shown in legends.

[D = Doppler Frequency shift

=Source Frequency in our study it refers to transmitted frequencies of Sunlight VIBGYOR spectrum

θ =angle determines the direction of Doppler effect, in this study point out to moving observer on rotating of earth towards or away from the Sun with respect to three Gayatri phases

V=Velocity of moving observer, in this context may be angular velocity (uniform acceleration) of the Earth's axis rotation.

C=Constant velocity of (Sun) light [arriving on Earth as the basis of constant shift of Gayatri phases on entire day time period].

This aspect of Earth -Sun light interaction exhibits a Doppler Effect leading to IRS event during Sun-Rise, noon and Sunset phases.

Schematically the Physical Phenomena of Gayatri with respect to location of sun in sky at sun rise (morning), mid sun (noon) and sun set (evening) from the observer view point may be

Geo-physical Aspects of Gayatri

The phenomenon of "Gayatri" ritual is performed thrice a day [8]. It infers that apparent shift of the Sun's location is temporally distributed in three separate spatial points of

daylight sky and could be attributed to Sun rise, Sun set and noon influenced by the angular rotation of earth and the axial tilt of the earth [22,23]. Since, the arc length of the Earth's angular rotation is proportional to the latitude (imaginary horizontal line) wherein the Earth's equator is the largest arc and the lowest near the north and south poles. Since, the imaginary arc length or the segment of latitude varies with the longitude (imaginary vertical line) spatial point the time gap between any two events of Gayatri phenomenon varies among three repeated events of Gayatri and is determined by the given length of the latitude (imaginary) vertical line of the globe.

The variation in the Gayatri phase may be due to the axial tilt of the earth at 23.40 [22]. This can be attributed to the highest time gap between any two of three Gayatri events. They remain largest at equator and shorter at the poles because of proportionate length of day-night cycle duration. The length of day-night cycle are governed for a given u value through an angle q as indicated from the value $|u|$ is positive for no day or no night in south and north poles and at equinoxes $q=0$ and $g= \pi/2-|q|$ [25] . However, the geo-physical phenomenon of Analemma [26] implies the influence of Gayatri in all eight directions of space as per the description of the traditional literature.

The Gayatri may be treated as a continuous repetition of three celestial Doppler events with three separated temporal phases through the day light period, but on the poles it may be limited

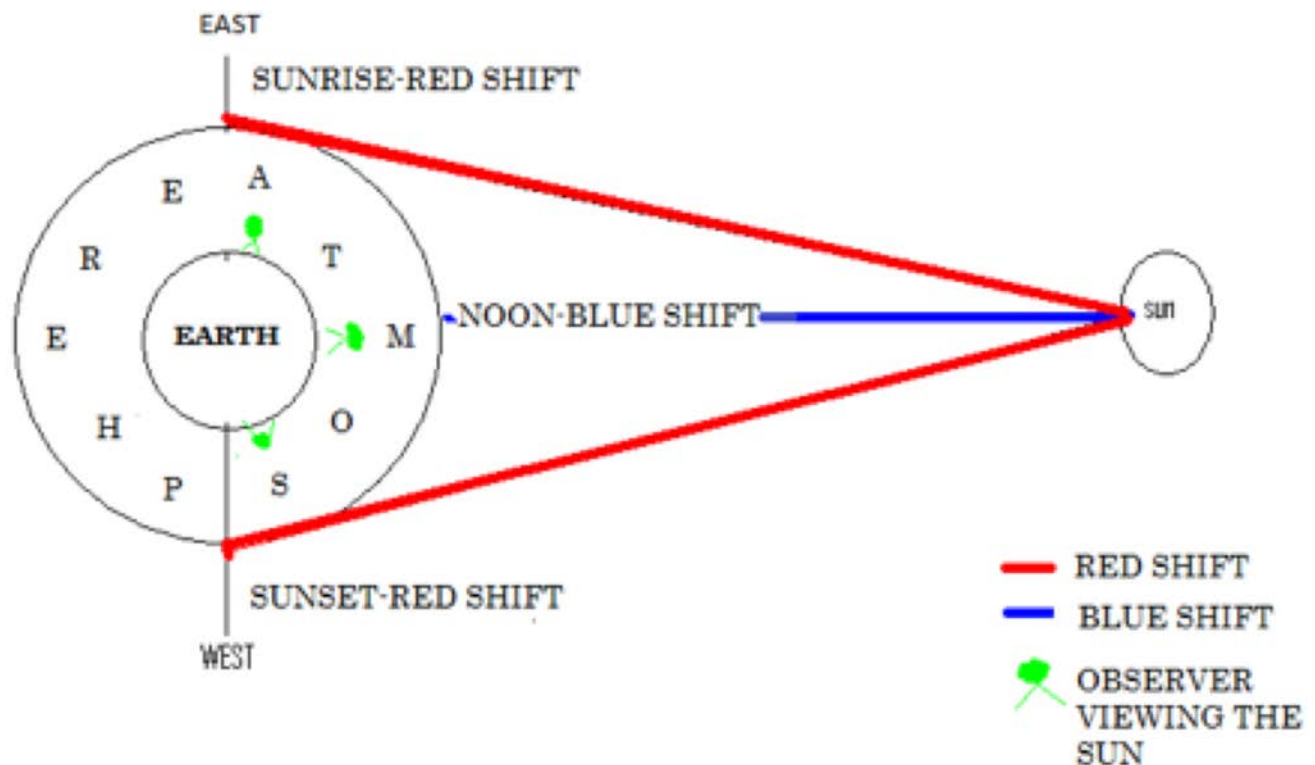


Figure 1: Illustration of Red and Blue shift sunlight spectrum as Physical events of three Gayatri phases

to only two events of Sun rise and Sun set in one of the poles throughout an year since, day and night time is stretched over six months duration. However, either of poles would have only mid noon phase or night phase.

The phenomenon of Gayatri may be addressed as celestial Doppler event. It exists in three Padas or phases, within, one half of earths' rotation (1800) that covers entire day light period. However, cumulatively, the angular velocity of earths' rotating on its own (earths') its axis, orbital velocity of earth around the sun besides constant velocity of light speed in all directions may be essential to exhibit ideal Doppler Effect. Mathematically, the ideal angle of rising sun rays tangential with reference to horizon (where sky and earth meets), if it would be 00, then the sun at noon phase will be 900 and at sun set would be at 1800. Therefore, the Doppler Effect of IRS could be the crux of "Gayatri" phenomena on the earth.

Various factors such as mass of the sun, earth orbit eccentricity, angular momentum of the earth, local latitude [25]. The length of the day-night cycle are governed by the perihelion and aphelion distances from the sun [22] may contribute to onset time of Doppler effect led IRS variation. The propagation of dominant wavelength of sun rays is due to Rayleigh scattering through atmosphere gaseous composition, dust particles, air layer thickness, humidity, temperature etc., seems to account for the observed intensity of dominant wavelength of the scattered sun rays.

Conclusion

The Gayatri, is a Celestial Doppler phenomena of IRS event that exhibits the Suns' visible spectrum shift from red to blue within 45-100 nm wavelength range due to Earths' rotation. The Doppler induced IRS on-set time depends on the angular velocity of planets' axis rotation and tilting of the planets' axis, while the intensity of twilight and noon skylight is attributed to Rayleigh scattering. It contributes to the varied the intensity of large red shifted polarized twilight skylight in Sun rise and the least polarized blue shifted sky light at the noon phase. This concept would be further extended to other planets orbiting the sun and the moon orbiting the planets of the solar system.

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