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ASTRONOMICAL PHENOMENA DISPROVE EINSTEIN'S SPECIAL RELATIVITY THEORY

A.V. Mamaev, Candidate of Technical Sciences, Bureau Chief
JSC «Lianozovo Electromechanical Plant Research and Production Corporation» (Moscow), Russia

Abstract. *This article shows that many astronomical phenomena can be explained by existence in nature of quadratic dependence of light speed upon speed of the light source motion. If such a dependence exists in the nature, the following effects can emerge in addition to the known Doppler effect: an effect of spacious grouping or ungrouping of photons and an effect of spacious deformation (compression or extension) of electromagnetic trains corresponding to photons. Using the effect of spacious grouping or ungrouping of photons it is possible to explain such phenomena as «novae», «supernovae», «hypernovae», pulsars and the object SS 433. Using the effect of spacious deformation (compression or extension) of electromagnetic trains corresponding to photons it is possible to explain such astronomical phenomena as bursts of cosmic X rays and gamma rays, red shift of far star spectrums increasing with growth of distances to stars, microwave background radiation, Olbers's paradox.*

Keywords: *novae, supernovae, hypernovae, pulsars, red shift of far stars spectrums, microwave background radiation, object SS 433, bursts of cosmic X rays and gamma-rays, quadratic dependence of light speed upon speed of light source motion, new relativistic space-time theory, Olbers's paradox.*

1. Introduction

The Special Relativity Theory (SRT), which was developed by Albert Einstein in his 1905 year paper «To electrodynamics of moving bodies» [1, p. 7–35], is the latest generally recognized scientific space-time theory and is based upon two principles (postulates), the first of which is known as the relativity principle, and the second one – as the principle of independence of light speed upon the speed of light source motion.

The second Einstein's postulate reads:

"Any ray of light moves in the "stationary" system of co-ordinates with the determined velocity c_0 = 299 792 458 m/s, whether the ray be emitted by a stationary or by a moving body" [1, p. 10]).

During all the time of the SRT existence it was stated that the second Einstein's principle is reliably confirmed by both astronomical observations and by laboratory experiments.

But in my published papers beginning from 1990 it was repeatedly underlined [2, p. 61–69], [3, p. 101–110], [4, p. 200–210], [5, p. 17–23] that both astronomical observations and laboratory experiments reliably confirm not absence in the nature of any dependence of light speed on the speed of light source, but only absence of the simplest dependence of light speed on the speed of light source having the form

$$\vec{c}_u = \vec{c}_0 + \vec{u}\ , \tag{1}$$

where $\vec{c}_u$ is the light speed vector from a moving source; $\vec{c}_0$ is the light speed vector from an immovable source; $\vec{u}$ is the light source speed vector. Under light source speed $\vec{u}$ we understand unlimited speed of motion (variable from zero to infinity), which we shall call Galilean speed.

In [2, p. 61–69], [4, p. 200–210], [5, p. 17–23], as well as in [6, p. 36–40] a specific quadratic dependence of the light speed upon the source speed in the form

$$c_u = c_0\sqrt{1+ u^2 / c_0^2} \tag{2}$$

was derived, which is not disproved by astronomical observations, but in fact is confirmed by them. If the Lorentz speed of motion (variable from zero to light speed in vacuum from Einstein's SRT [1, p. 7–35]) is used and is denoted by a symbol $\vec{V}$, then the relation between the Lorentz speed and the Galilean speed will be expressed by relationships [7, p. 303–311]

$$V = \frac{u}{\sqrt{1+ u^2 / c_0^2}};\quad u = \frac{V}{\sqrt{1- V^2 / c_0^2}}\ . \tag{3}$$

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De-Sitter [8, p. 1267] was the first researcher, who has examined whether the formula (1) is confirmed or disproved by astronomical observation. He analysed the results of astronomical observations of the β Aurigae binary star (beta of the Charioteer constellation) with almost circular orbit (ellipse eccentricity e = 0.005) and with an average speed of motion of near 110 km/s and proved, that dependence of (1) type is disproved by these astronomical observations, and even if dependence of light speed upon speed of source exists in nature and has the form

$$c_u = c_0 + k \cdot u\,, \qquad (4)$$

where k is an unknown coefficient, than these observations lead to the value of k complying with the inequality k < 0.002.

But if we expand the function (2) into a series and confine ourselves to the first two expansion terms, then we obtain the formula (4), in which

$$k = 0.5\,\frac{u}{c_0}\,. \qquad (5)$$

And then, if we substitute the value of the average speed of the star u = 110 km/s and the value of light speed in vacuum c_0 = 299 792 458 m/s into the formula (5), we obtain according to (5) the value k = 0.000183, that means the value, which is more than 10 times less than the value, which was obtained by De-Sitter (he obtained k < 0.002). Consequently, at low speeds of sources motion we may neglect the dependence of light speed upon speed of light source motion according to formula (2), if the distance between a light source and a light receiver (or an observer) is also small.

So, the first feature of dependence (2) is independence of light speed upon speed of light source motion in case of small speeds of sources motion, considering that $k \approx 0$ in the formula (4) (indeed even at source speed equal to 110 km/s k differs from zero negligibly, because k = 0.000183).

The second feature of dependence (2) is independence of light speed upon direction of source motion – whether a source moves in the direction of an observer, or it moves away from the observer, according to the formula (2) the light speed is not changed (indeed, at changing the direction of source motion from approaching to an observer to moving away from the observer only a sign of speed is changed (substitution of a plus for a minus), but after quadrating the speed according to formula (2) the result will be the same).

2. New effects due to dependence of light speed upon the speed of light source

If the quadratic dependence (2) of the speed of light propagation upon the speed of light source motion exists in the nature, then the following new effects influencing upon propagation of light through tremendous cosmic distances can be observed as a consequence of stars motion at variable speeds: a) the effect of spacious grouping or ungrouping of light quanta (photons), b) the effect of deformation (extension and shortening) of a wavetrain corresponding to a quanta.

2.1. The effect of spacious grouping of photons

Digital simulation of light propagation through tremendous cosmic distances performed in [4, p. 243–297] shows that the stars called as «novae» and «supernovae» and pulsars can be not the results of physical explosions of stars, but the results of effects of spacious grouping of light quanta (photons) owing to existence in nature of quadratic dependence of light speed upon speed of source motion according to formula (2) and motion of stars in binary star systems along Kepler orbits, see also [5, p. 32–40]. Because it is well known that the large majority (if not all) of novae are close binary systems [9, p. 163].

Indeed, let us consider fig. 1, in which trajectories of two stars in a binary system are shown as moving from apastrons (points A_1, A_2) to periastrons (points P_1, P_2). A speed u_P of any star motion in a periastron is greater than a speed u_A of any star motion in an apastron [10, p. 490]

$$\frac{u_P}{u_A} = \frac{1+e}{1-e} = m, \qquad (6)$$

where e is an eccentricity of the ellipse (a ratio of a distance between an ellipse focus and its centre to a length of the ellipse principal semiaxis).

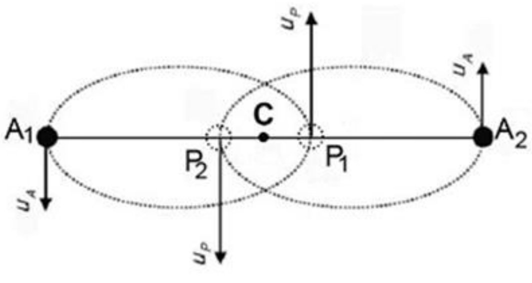

Fig. 1. Trajectories of two identical stars in a binary system orbiting along ellipses around a common centre of masses (C) coincident with common focuses of two ellipses

Fig. 1 shows, that if, for example, a terrestrial observer is situated in the direction of a lower border of this paper page, then the speed vector of the first star, which is in the apastron A_1, is directed towards the terrestrial observer, and the speed vector of the second star, which is at the same time in the apastron A_2, is directed in a direction opposite to the direction onto the terrestrial observer. But in the formula (2) the speed vector of the light source is raised to the second power. Therefore if the two vectors of light source speeds have identical numerical values but opposite directions, then according to the formula (2) light quanta from two stars will move to a terrestrial observer at the same light speed irrespective of the fact that the light sources move in opposite directions.

Now let us consider fig. 2, in the upper part of which speeds of movement of both stars of a binary system shown in fig. 1 are depicted with respect to a coordinate system with an origin in point C of fig. 1.

In the upper part of fig. 2 an instant of time t_A (event A) is such an instant, when the both stars of this binary system are in their apastrons and are moving at a speed u_A. An instant of time t_P (event P) is such an instant, when the both stars of this binary system are in their periastrons and are moving at a speed u_P. An instant of time t_{A2} (event A_2) is such an instant, when the both stars of this binary system are again in their apastrons and are again moving at the speed u_A.

The lower part of the same fig. 2 shows propagation in cosmos of light along a straight line AE (moving at a speed C_A) emitted by the stars of the binary system from apastrons (event A), as well as propagation in cosmos along a straight line PE of light, (moving at a speed C_P) emitted by the stars of the binary system from periastrons (event P).

As far as $C_P > C_A$ (because $u_P > u_A$ and C_P and C_A, are calculated according to the formula (2)), a tilt angle of the straight line PE with respect to the time axis is greater than a tilt angle of the straight line AE with respect to the time axis. The speeds of both stars of the binary system moving from apastrons to periastrons are increasing during all time of stars movement from apastrons to periastrons (see the upper part of fig. 1). The speeds of both stars of the binary system moving from periastrons to apastrons are decreasing during all time of the stars movement from periastrons to apastrons (see also the upper part of fig. 1). The light emitted by the binary system stars at the time instant t_{A2} has the same speed as the light emitted by the binary system stars at time instant t_A. The straight line A_2K, corresponding to propagation of light from the event A_2 to the event K, is parallel to the straight line AM, corresponding to light propagation from the event A to the event M.

In order to simplify formulas and to decrease time for calculations it is supposed that the plane of elliptical orbits of binary system stars is perpendicular to a line connecting the binary system mass centre with an observer. In such case distances from all points of binary system stars orbits to an observer are identical and time of light propagation from stars of the binary system to the observer does not depend on position of stars on their orbits and does depend only on the speed of a star (if speed of light depends on the speed of light source motion).

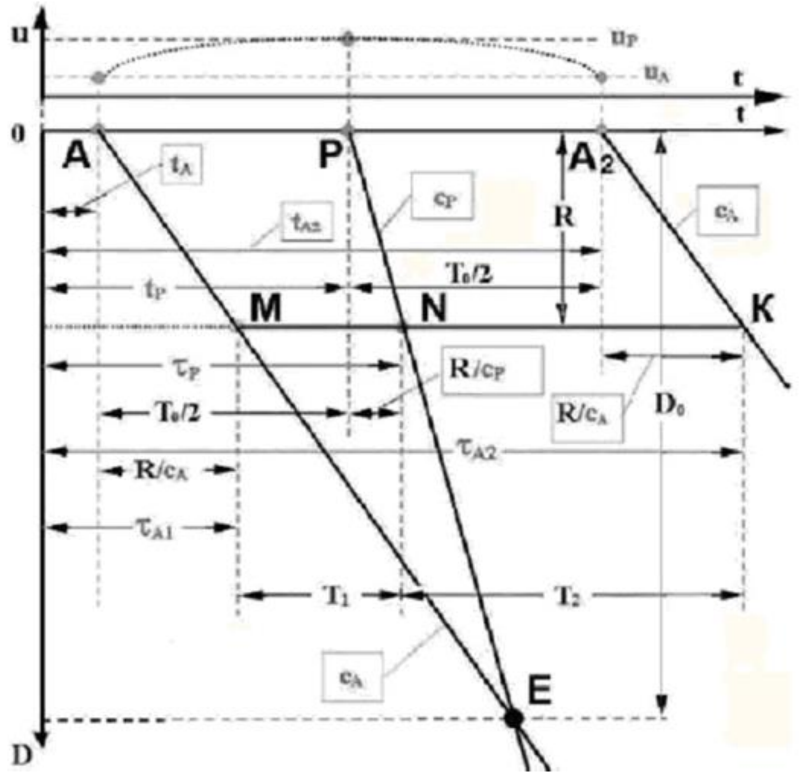

Fig. 2. Propagation of light in cosmos through large distances from sources moving at variable speeds ($T_0 = T_1 + T_2$).

Light emitted by stars of the binary system at the time instant t_P of their passage through the periastrons (event P in fig. 2) has considerably greater speed, than light emitted by stars of the binary system at the time instant t_A of their passage through the apastrons (event A in fig. 2), hereupon light quanta emitted later (after a half period of the stars revolution along their orbits), overtake in cosmic space those light quanta, which the stars have emitted earlier – see event E in fig. 2, which takes place at a distance

$$D_0 = \frac{T_0 c_0^3}{\left(u_P^2 - u_A^2\right)} \tag{7}$$

from the binary star. Event E takes place in such a point of cosmic space, situated at a distance D_0 from point C of the binary system in fig. 1, into which light quanta emitted by stars of the same binary system at time instants of subsequent events A and P arrive simultaneously.

It is obvious that light quanta emitted by stars of the same binary system at time instants of subsequent events A and P arrive not simultaneously to points, situated nearer and farther than D_0 from the binary system.

For example, let us consider an observer being at rest at a distance R from the binary system (see fig. 2). The light radiated by two stars of the binary system at the time instant t_A, when the both stars are in apastrons (event A), arrives to such an observer at a time instant

$$\tau_{A1} = t_A + R / c_A \tag{8}$$

(in fig. 2 this event is denoted by letter M).

And the light radiated by the two stars of the binary system at the time instant t_P, when the both stars are in periastrons (event P), arrives to the considered observer at a time instant

$$\tau_P = t_P + R / c_P \tag{9}$$

(in fig. 2 this event is denoted by letter N). And the light emitted by the binary system at time instant t_{A2}, when the both stars of the binary system will again be in apastrons (in fig. 2 this event is denoted by a letter A_2), arrives to this observer at a time instant

$$\tau_{A2} = t_{A2} + R / c_A \tag{10}$$

(in fig. 2 this event is denoted by letter K).

For such observer (being at rest at a distance R from point C of the binary system shown in fig. 1 on a line perpendicular to a line connecting points A_1 and A_2 in fig. 1 in a direction of the lower edge of the page) a time interval, during which the both stars of the binary system move from apastrons to periastrons at increasing speeds, will be equal to a time interval T_1 between events M and N in fig. 2. And for the same observer a time interval, during which the both stars of the binary system move from periastrons to apastrons at decreasing speeds, will be equal to a time interval T_2 between events N and K in fig. 2.

From fig. 2 it is well seen that

$$T_1 = \tau_P - \tau_{A_1}, \tag{11}$$

$$T_2 = \tau_{A_2} - \tau_P. \tag{12}$$

For an observer, situated at a distance D_0 from point C of the binary system in fig. 1, the first half-period will be equal to zero ($T_1 = 0$). Because signals from events A and P arrive to such observer simultaneously – see event E in fig. 2.

For such observer (situated at a distance D_0 from the binary system) the second half-period T_2 (during time of stars movement from periastrons to apastrons at decreasing speed) will become equal to the whole period ($T_2 = T_0$).

To tell the truth, simulation of light propagation from a binary system of identical stars through tremendous cosmic distances, when stars move according to Kepler’s laws, shows that approximate equation $T_1 \approx 0$ is achieved not for distance D_0 under formula (7), but for approximate distance $R \approx 0.7\ D_0$.

Thus, the analysis and digital simulation of light propagation from sources moving along Kepler’s orbits through tremendous distances in cosmic space show, that in cosmic space there are such points, to which the light, which the binary system emitted during a time interval equal to the first half-period of its rotation along Kepler's orbit (during which the stars move at speeds increasing in time), arrives practically simultaneously (during some months for a half-period equal to thousands of years). And the light, which was emitted by the stars of the binary system during the second half-period of stars rotation along Kepler's orbits (during which the stars move at speed decreasing in time), will be distributed approximately uniformly along a time interval equal to the whole period of binary stars rotation.

This effect of spacious grouping of light quanta as a consequence of stars movement along Kepler's orbits and existence in nature of quadratic dependence of light speed upon speed of light sources results in such a phenomenon that binary stars system normally existing for observers situated near such stars for observers situated at distances $R \approx 0.7\ D_0$ will seem to be exploding stars (as novae, supernovae, hypernova).

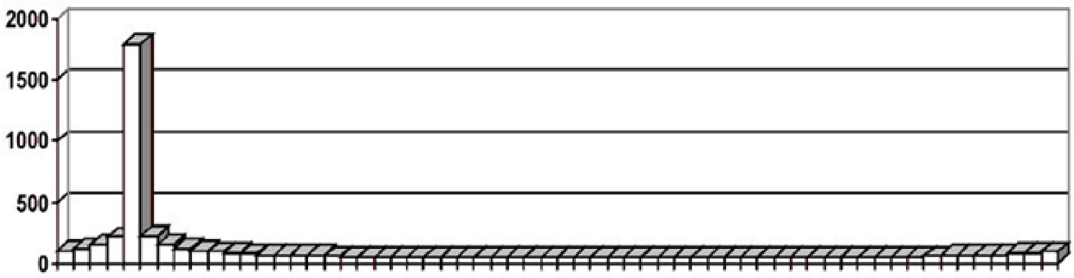

Fig. 3. A burst of binary star system brightness obtained by means of simulation for $R \approx 0.7\ D_0$. (similar to novae or supernovae)

Simulation shows that binary stars situated significantly nearer than D_0 look like cepheids – stars with variable luminosity (see fig. 4), which luminosity grows together with growth of their period [11, p. 380].

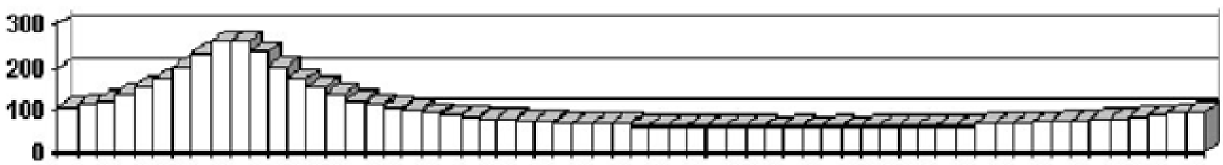

Fig. 4. Change of binary stars system brightness obtained by means of simulation for $R \approx 0.4\ D_0$ (similar to cepheids)

At distances exceeding D_0 two subsequent bursts of brightness are formed (see fig. 5 and fig. 6 below, as well as many other figures in [4, p. 259–272]). The first burst of brightness has very quick droop, but the second burst of brightness has a comparatively slow droop of star brightness.

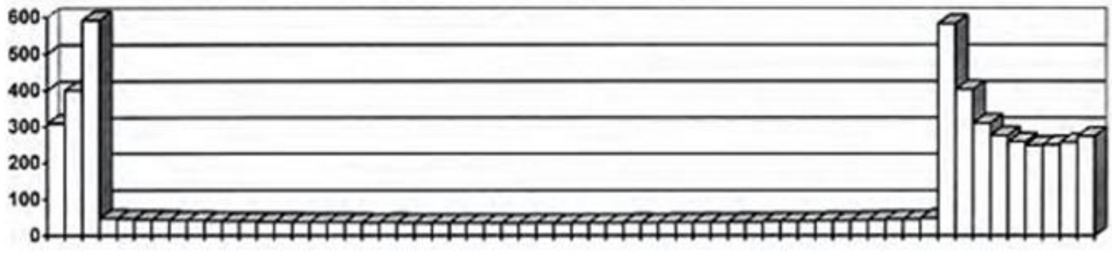

Fig. 5. Bursts of binary stars system brightness obtained by means of simulation for $R \approx 1.2\ D_0$.(similar to novae or supernovae)

When the distance from an observer to a binary star varies, the time interval between two bursts is also varied (compare fig. 5 with fig. 6).

Fig. 6. Bursts of binary stars system brightness obtained by means of simulation for $R \approx 1.8\ D_0$. (similar to novae or supernovae)

Examination of bursts of binary star brightness shows that the greater is the period of rotation of binary stars along Kepler's orbits, the greater is the value of the burst amplitude at equality of all other parameters.

Further examination of the procedure of photons grouping by means of simulation method shows that pulsars also can be explained as a result of spacious grouping of photons in the cosmic space (see [4, p. 110 - 111]). In figures 3–6 the results of spacious grouping of photons are depicted for various distances of an observer from a binary star system during one period of stars revolution along elliptical orbits.

2.2. Effect of deformation of electromagnetic wave trains

In addition to the effect of spacious grouping of light quanta the procedure of light propagation is influenced also by a well known Doppler effect and the effect of deformation of electromagnetic wave (EMW) trains as a consequence of dependence of light speed upon speed of light source movement [2, p. 36–43], [4, p. 155–164], [5, p. 53–57].

The Doppler effect we consider here as a known one, and the effect of deformation of electromagnetic wave trains can be explained as follows.

Each excited atom of any star substance matter heated to high temperature radiates light quanta (photons). Each atom radiates a train of almost monochromatic electromagnetic waves having a finite length in space so, that we can differ the beginning of such EMW train from its end. Light emitted by stars is a superimposition of a tremendous quantity of EMW trains non-coherent each with other, i. e. actually we observe a kind of "light noise" – random non-coherent oscillations of electromagnetic field.

If the speed of light propagation depends upon speed of light source motion during emission of light, and if the light source moves at time-varying speed, that takes place also when stars move along Kepler's orbits, then, strictly speaking, the beginning of each EMW train emitted by the substance matter of any star will have the speed of motion differing from the speed of motion of the end of the same EMW train. Therefore the EMW train further deformation behaviour depends upon during which half-period of binary star motion along Kepler's orbit that or other EMW train was emitted.

2.2.1. Bursts of X-rays and gamma-rays as a result of wave trains compression

If any EMW train is emitted during such a half-period of a binary star rotation, when both stars of the binary star system move at speeds increasing in time, that takes place when the stars of the binary system move from apastrons to periastrons, then the end of such EMW train will be emitted at a time instant, when a star that is a source of this EMW train moves at a speed greater than the speed of the same star when the beginning of this EMW train was emitted. Therefore during some subsequent interval of time such EMW train will move in space in such a manner, that its end will move at greater speed than its beginning and such EMW train will suffer compression in time till such an instant of time when the train end will overtake its beginning. After such time instant the EMW train beginning (its former end) will move at a greater speed than its current end (its former beginning) and at any future time instant this EMW train will suffer extension.

Thus, for all EMW trains emitted by some binary star system during a half-period, when stars of that binary star system move at speeds increasing in time, ends of these EMW trains move in cosmic spaces at greater speeds than beginnings of all that EMW trains and all that trains suffer compression. During such EMW train compression frequency of light quanta becomes greater (increases) and wavelength of light quanta becomes shorter (decreases). Such shift of light quanta spectrum, when EMW trains become compressed is called as violet shift of frequency or shift to shorter wavelengths.

The effect of light spectrum shift to shorter wavelengths can be a cause of emergence of X-rays bursts and gamma rays bursts. Because at light spectrum shift to shorter wavelengths all photons with wavelengths from a diapason of (380–740) nm after propagation through tremendous cosmic distances can be converted to EMW of X-rays wavelengths diapason (from 0.01 to 10 nm) or to gamma rays wavelengths diapason (< 5 pm).

The peculiarity of behaviour of EMW trains emitted during a half-period when both stars of a binary-star system move at speeds increasing in time is existence of a time instant, when the EMW train end overtakes EMW train beginning. After that time instant such EMW train moves at decreasing in time frequency and at increasing in time wavelength.

It is known that important peculiarity of novae light spectrums is the shift to shorter wavelengths of absorption spectrums [12, p. 56]. As far as according to a mechanism of formation of binary star brightness bursts considered in this paper this bursts occur because of movement of both stars of a binary system at a speed increasing in time and because of dependence of light speed upon speed of light source movement under formula (2), then at absorption spectrums shift to shorter wavelengths the radiation spectrum of the binary star system also shifts to shorter wavelengths. Because in accordance with Kirchhoff's law the substance matter absorbs those lines of the spectrum, which it radiates being a source of light.

Thus, experimentally observed shift of novae light spectrums to shorter wavelengths confirms the existence in nature of light speed dependence upon light source speed under formula (2).

2.2.2. Red shift of far star spectrums and microwave background radiation

If some EMW train is emitted during such a half-period of a binary system stars rotation, when both stars of the binary star system move at speeds decreasing in time, then the end of such EMW train will be emitted at a time instant, when a star that is a source of this EMW train moves at a speed less than the speed of the same star when the beginning of this EMW train was emitted. Therefore during all future time of such EMW train propagation in space its beginning will move at greater speed than its end and such EMW train (radiated during a half-period, when both stars of binary system move at speed decreasing in time) will suffer extension all the time of its existence. Therefore such EMW trains suffer a shift to longer wavelengths or a shift to red frequencies.

For EMW trains propagating through very large distances the effect of changing frequency is identical for all trains (both for trains emitted during a half-period, when the stars are moving at speed increasing in time, and for trains emitted during a half-period, when the stars are moving at speed decreasing in time) – they suffer shift to red frequencies. This can be explained so that even if EMW train is emitted by a star moving at a speed increasing in time, then always in cosmic space there is such large distance, after which the end of any EMV train moving faster than its beginning catches up and surpasses its beginning and further the said train suffers only extension and red shift. Such behaviour of EMW trains shifting at propagation through very large distances is a cause of red shift of far star spectrums increasing with growth of distance to stars.

Thus, cosmological red shift of far stars spectrums increasing with growth of distances to such stars in case of existence of light speed dependence upon speeds of light sources is explained not by expanding of space (after the Big Bang), but by more prosaic causes.

And microwave background radiation, consequently, is not a «relict» radiation remaining after the «Big Bang», which did not exist ever, but a summary radiation of all the stars of stationary Universe.

2.2.3. Object SS 433

Such astrophysical phenomenon as «object SS 433» [13, p. 65–71] can also be explained by effects considered above.

Let us consider the binary stars system consisting of two identical stars moving along identical ellipses around C as it is shown in fig. 1. Let point C of this system be in deep cosmos far from the Sun and the Earth at a distance R shown in fig. 2 and the period of this system rotation around C is equal to T_0. Let the distance R from Earth to point C be such great, that terrestrial observer can not distinguish points A_1, A_2, P_1, and P2 each from other.

We know that when each star moves smoothly from an apastron to a periastron speed of each star smoothly increases from some minimal value u_A to some maximal value u_P shown in the upper part of fig. 2 and when each star moves smoothly from a periastron to an apastron the speed of each star decreases from a maximal value u_P to a minimal value u_A .

Position of terrestrial observer is shown in fig. 2 with a straight line parallel to a time axis and passing through time instants M, N, K, and the binary star system is in the origin of coordinate system time-distance in point 0 (zero point of distance scale).

Then, if the terrestrial observer is at distance from the binary star system less than D_0 (determined by formula (7) and shown in fig. 2), then for the terrestrial observer the half-periods of each star motion at a speed increasing in time will decrease to a value T_1, also shown in fig. 2 and fig. 7, and the half-periods of each star motion at a speed decreasing in time will increase to a value T_2, also shown in fig. 2 and fig. 7.

In fig. 7 we can see frequency spectrums of light from the object SS 433 changing in time, as well as decreased values of half-period T_1 and increased values of half-period T_2 for frequency spectrum changes.

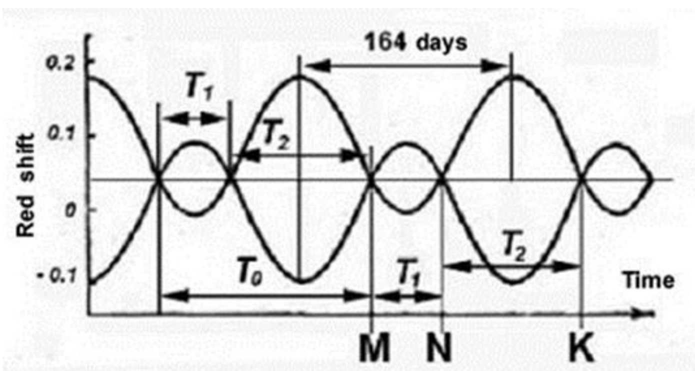

Fig. 7. Dependence in time of frequency spectrums of light from the object SS 433 as spectrums of a binary star system with an orbiting period equal to T_0 = 164 days (letters M, N and K denote the same events that are shown in fig.2)

In fig. 7 the following designations were used:

T_1 are compressed (for a remote observer) half-periods of a binary system both stars motion from apastrons to periastrons, caused by the effect of light quanta grouping at their radiation by stars, moving at speeds increasing in time (with simultaneous influence of the Doppler effect);

T_2 are extended (for a remote observer) half-periods of a binary system both stars motion from periastrons to apastrons, caused by the effect of light quanta ungrouping at their radiation by stars, moving at speeds decreasing in time (with simultaneous influence of the Doppler effect);

$$T_0 = T_1 + T_2 .$$

The light emitted by the both stars of the binary system during a half-period with duration of 0.5 T_0 = 82 days (for the local observer situated near the system of binary stars) of stars motions from apastron (from point A) to periastron (into point P) will be received by a terrestrial observer situated at a distance R (for the object SS-433 equal to approximately 5 kiloparsec, at that 1 parsec = $3.0857 \cdot 10^{16}$ m), during a time interval of T_1 = 54.7 days, which is determined by a formula (11).

Having substituted into the formula (11) the values (8) and (9), as well as equations $c_A = c_0 \sqrt{1 + u_A^2 / c_0^2}$ and $c_P = c_0 \sqrt{1 + u_P^2 / c_0^2}$, we obtain the formula

$$T_1 = \tau_P - \tau_A \approx 0.5 \cdot T_0 - \frac{0.5 \cdot R \cdot (u_P^2 - u_A^2)}{c_0^3} . \qquad (13)$$

The light emitted by the both stars of the binary system during a half-period with duration of $0.5T_0$ = 82 days (for the local observer situated near the system of binary stars) of stars motion from periastron (from point P) to apastron (into point A) will be received by the terrestrial observer situated at a distance R ≈ 5 kiloparsec during a time interval of $T_2 \approx$ 109.4 days, which is determined by the formula (12).

Having substituted in the formula (12) the values (9) and (10), as well as equations $c_A = c_0 \sqrt{1 + u_A^2 / c_0^2}$ and $c_P = c_0 \sqrt{1 + u_P^2 / c_0^2}$, we obtain the formula

$$T_2 = \tau_{A_2} - \tau_P \approx 0.5 \cdot T_0 + \frac{0.5 \cdot R \cdot (u_P^2 - u_A^2)}{c_0^3} . \qquad (14)$$

Taking into consideration the effects of light quanta sizes compression – extension and the Doppler effect, formulas for angular frequency and for wave length of electromagnetic waves emitted during a half-period of the binary system stars motion at a speed increasing in time and received by a remote observer situated at a distance *R* from the binary system have the form

$$\omega = \frac{\omega_0}{\left[1 + \frac{(c_2 - c_1) \cdot R}{c_0 \cdot L_0}\right] \cdot (1 - \beta \cdot \cos\theta)} , \qquad (15)$$

$$\lambda = \lambda_0 \cdot \left[1 + \frac{(c_2 - c_1) \cdot R}{c_0 \cdot L_0}\right] \cdot \frac{1 - \beta \cdot \cos\theta}{\sqrt{1 - \beta^2}} , \qquad (16)$$

where $c_2 > c_1$.

Taking into consideration the effects of light quanta compression – extension and the Doppler effect, formulas for angular frequency and for wave length of electromagnetic waves emitted during a half-period of the binary system stars motion at a speed decreasing in time and received by a remote observer situated at a distance R from the binary system, have the form

$$\omega = \frac{\omega_0}{\left[1 - \frac{(c_1 - c_2) \cdot R}{c_0 \cdot L_0}\right] \cdot (1 - \beta \cdot \cos\theta)} , \qquad (17)$$

$$\lambda = \lambda_0 \cdot \left[1 - \frac{(c_1 - c_2) \cdot R}{c_0 \cdot L_0}\right] \cdot \frac{1 - \beta \cdot \cos\theta}{\sqrt{1 - \beta^2}}, \quad (18)$$

where $c_2 < c_1$. At that it is not difficult to see, that the formula (17) coincides with the formula (15) and the formula (18) coincides with the formula (16).

In formulas (15)–(18) the following designations are used:

$$\beta = \frac{u}{c_u}, \qquad c_u = c_0 \sqrt{1 + \frac{u^2}{c_0^2}};$$

ω_0 is the angular frequency of electromagnetic oscillations measured by an observer that is at rest with respect to their source;

λ_0 is the wavelength of electromagnetic oscillations measured by an observer that is at rest with respect to their source;

L_0 is a spacious length of a light quantum (photon);

c_1, c_2 are speeds of motion of the EMW train beginning and end respectively;

θ is an angle between a line from a source of electromagnetic wave to an observer and a source speed vector.

3. Conclusion

If the quadratic dependence of light speed upon the speed of source motion exists in the nature and has the form $c_u = c_0\sqrt{1 + u^2 / c_0^2}$, where ***u*** is the speed of light source, then a great number of astronomical phenomena can be explained only by this dependence and there is no need to use every time another cause for explanation of that or another astronomical phenomenon. Using this dependence it is possible to explain periodic changes of brightness of a great number of stars known now as cepheids, periodic bursts of brightness of stars known now as «novae», «supernovae» and «hypernovae», as well as pulsars. This is achieved by using the effects of spacious grouping or ungrouping of photons moving in cosmic space at speeds depending upon speeds of motion of stars, which are the sources of such photons.

Using the effects of spacious deformation (compression or expansion) of electromagnetic wave trains because of motion of various parts of this trains at various speeds depending on speeds of light sources, it is possible to explain bursts of cosmic X-rays and gamma-rays, red shifts of light spectrums from far stars increasing with growth of distances to stars, microwave background radiation. The object SS 433 can be explained by summary influence of the Doppler effect and the effects of spacious grouping and ungrouping of photons, as it is seen from fig. 7 and formulas (15)–(18). Formulas (15)–(16) describe change of frequency and wave length of electromagnetic waves radiated by stars of binary systems during the half-period when stars move at speeds decreasing in time, and formulas (17)–(18) describe change of frequency and wave length of electromagnetic waves radiated by stars of binary systems during the half-period when stars move at speed increasing in time.

A. Einstein noted, that «The theory pursues two purposes: 1. To embrace whenever possible all phenomena in their interrelations (completeness). 2. To achieve that purpose taking as primary notions as few as possible quantity of mutually connected logical notions and arbitrary established relations (main laws and axioms) between them. This purpose I shall name as «logical onliness» [14, p. 264].

In connection with this it is expedient to notice, that, first of all, many astronomical phenomena can be explained as confirmation of existence in the nature of quadratic dependence of light speed upon speed of its source from the new relativistic space-time theory, and, secondly, that the new relativistic space-time theory is based on the only relativity principle, but not on two principles as it happens with Einstein's SRT, who declared about logical onliness of his theory.

In conclusion we should like to note that only owing to professor's B. P. Peshchevitsky evaluation it became possible to publish the paper [2] 24 years ago.

REFERENCES*

1. Einstein, A. To Electrodynamics of Moving Bodies / A. Einstein. Collection of Scientific Papers. – v. 1. – M. : Nauka, 1965. – P. 7–35 (In Russian).

2. Mamaev, A. V. The essence of the New Space-Time theory improving the Special Relativity Theory / A. V. Mamaev. – Russia, Tula: TVAIU. – 1990. – 76 p. // Deposited in VINITI 03.09.1990, No. 4861-V90 (In Russian).

3. Mamaev, A. V. The Essence of the Third Space-Time Theory. – Appendix to Journal of non-traditional ideas. / A. V. Mamaev. – Issue 3. Relativity Theory: pro et contra. Collection of Reports of All-Union Conference FENID-91, v. 1. – Gomel, 1991. – P. 101–110 (In Russian).

4. Mamaev, A. V. New Relativistic Space-Time Theory. Physics with dependence of charge on speed, without prohibition of superlight speeds and without time dilation. / A. V. Mamaev. – Saarbrucken, Deutschland : LAP Lambert Academic Publishing,

2013. – 328 p. (In Russian).
5. Mamaev, A. V. New Relativistic Space-Time Theory / A. V. Mamaev // The Way of Science: International Scientific Journal. 2014. – No. 1 (1) – P. 10–84. – URL: http://scienceway.ru/d/706321/d/the-way-of-science--1-%281%29-march.pdf (In Russian).
6. Mamaev, A. V. Speed of Light in Vacuum of Moving Inertial Reference Frame / A. V. Mamaev // Science and World: International Scientific Journal. – 2014. – No. 1 (5) – P. 36–40. – URL: http://scienceph.ru/d/413259/d/science-and-world--1-%285%29-january_1.pdf (In Russian).
7. Rapier, P. M. A Recent Application of Detection and Estimation Practices in Radio and Radar Astronomy / P. M. Rapier // Spectroscopy Letters. – 1971. – No 4 (9). – P. 303–311.
8. Von, W. de Sitter. // Physik. Zeitschr. – 1913. – 14, 1267.
9. Shklovsky, I. S. Stars, their birth, life and death / I. S. Shklovsky. – M. : Nauka, 1984. – 163 p. [Electronic resource]. – URL: http://www.plam.ru/phisika/zvezdy_ih_rozhdenie_zhizn_i_smert/index.php (In Russian).
10. Duboshin, G. N. Celestial mechanics. Main problems and methods. / G. N. Duboshin. – M. : Nauka, 1968. – 490 p. (In Russian).
11. Popov, P. I. Astronomy / P. I. Popov, K. L. Baev, B. A. Vorontsov-Velyaminov etc. – M. : Uchpedgiz, 1958. – 380 p. (In Russian).
12. Pskovsky, Ju. P. Novae and Supernovae / Ju. P. Pskovsky. – M. : Nauka, 1985. – 56 p. [Electronic resource]. – URL: http://www.astronet.ru/db/msg/1201870/index.html (In Russian).
13. Cherepashchuk, A. M. Unique Astrophysical Object SS 433. / A. M. Cherepashchuk // Soros's Educational Journal. – 2000. – V. 6. – No. 7. – P. 65–71. [Electronic resource]. – URL: http://www.pereplet.ru/nauka/Soros/pdf/0007_065.pdf (In Russian).
14. Einstein, A. Physics and Reality / A. Einstein. – M. : 1965. – 264 p. (In Russian).

** The titles are given in author's translation.*

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АСТРОНОМИЧЕСКИЕ ЯВЛЕНИЯ ОПРОВЕРГАЮТ СПЕЦИАЛЬНУЮ ТЕОРИЮ ОТНОСИТЕЛЬНОСТИ ЭЙНШТЕЙНА

А.В. Мамаев, кандидат технических наук, начальник бюро
ОАО «НПО Лианозовский электромеханический завод» (Москва), Россия

Аннотация. *В статье показано, что многие астрономические явления могут быть объяснены существованием в природе квадратичной зависимости скорости света от скорости движения источника света. Если такая зависимость существует в природе, в добавление к известному эффекту Доплера могут возникнуть следующие эффекты: эффект пространственного группирования или разгруппирования фотонов и эффект пространственной деформации (сжатия или растяжения) цугов электромагнитных волн, соответствующих фотонам. При помощи эффекта пространственного группирования или разгруппирования фотонов можно объяснить такие явления, как новые, сверхновые, гиперновые звезды, пульсары и объект SS 433. При помощи эффекта пространственной деформации (сжатия или растяжения) цугов электромагнитных волн, соответствующих фотонам, можно объяснить такие явления, как вспышки космических рентгеновских и гамма лучей, красное смещение спектров далеких звезд, увеличивающееся с ростом расстояний до звезд, микроволновое фоновое излучение, парадокс Ольберса.*

Ключевые слова: *новые, сверзновые и гиперновые звезды, пульсары, красное смещение спектров далеких звезд, микроволновое фоновое излучение, объект SS 433, вспышки космических рентгеновских и гамма лучей, квадратичная зависимость скорости света от скорости движения источника света, новая релятивистская теория пространства-времени, парадокс Ольберса.*