光子的运动满足惯性定律在量子力学和宇宙学中的应用

The application of the photons' movement meet Newton's laws of motion in quantum mechanics and cosmology

Chapter 1 The application of the photons'[1] movement meet Newton's first law of motion[2] in quantum mechanics

Section 1 Deducing cosmic microwave background[3] by photons meet Newton's first law of motion and Maxwell's equations[4].

There is two explanation of the Michelson–Morley experiment[5]:

First. There is no aether. [5] Second. There is aether. But different from sound or water lines, the photons' born and movement in the aether meet Newton's laws of motion.

No one ever thought of the second assumption. What if it is true?

Assuming the second set up, then the speed of the photon satisfy the Galilean transformation in different inertial frame of reference[6].

By Maxwell's equations, we know that photon is interconversion of electric potential energy[7] and magnetic potential energy, meanwhile new photon was sent out by the speed of light c[4] as its relative velocity for the inherit inertial frame of reference.

When we catch up photons with speed c, we will see electric potential energy and magnetic potential energy periodically return to zero and convert to each other. Each photon have a conversion space which length equal to half of the wavelength[4]. And their zeroreturn and interconversion have a inherent frequency, which will not change in different inertial frame of reference. And because of photons' electric potential energy is periodically return to zero, so their inherent frequency can be observed whatever. This is the cosmic microwave background[3].

As the photon's electric or magnetic potential energy doesn't exist like electric or magnetic field, so the aether have ability to make electric or magnetic potential energy back to zero, called aether return.

Because of the distribution of cosmic microwave background is continuous[3], different electromagnetic radiation has different inherent frequency. In other words, wavelength of electromagnetic radiation was changed by photon's inherent frequency. As its conversion space length equal to half of the wavelength[4], so photon's length of conversion space was changed by its inherent frequency.

If the frequency of the electromagnetic radiation is υ , photon's length of conversion space is D, the relative velocity of photon is C. According to the Maxwell's equations[4], υ =C/2D.

Section 2 The application of electromagnetic potential energy inherent frequency in quantum mechanics[8]

According to the double-slit experiment of electron[9], conclusion that electron is interconversion of electromagnetic potential energy itself. Then Schrödinger equation[10] is describing the interconversion of electron's electric magnetic potential energy.

Then the thermal radiation is the progress of electron absorbing and releasing electromagnetic potential energy[11]. Together with Planck's law[12], conclusion that

electromagnetic potential energy can combine at certain situation. The photons' electromagnetic potential energy will get bigger and length of conversion space will get shorter after combine.

According to the Compton scattering, photon have momentum.[1] And together with photon meet Newton's laws of motion, conclusion that there's difficulty when changing photon's inertia, which means photon have mass.[2] The reason of linebroadening is the photons' relative velocity of get changed with the movement of electron. And the mass of the photons were different when their inherent frequency were different.

Assuming the mass of the electromagnetic radiation proportional to their inherent electromagnetic potential energy, conclusion that the proton and the neutron and so on[13] might just some stable form of electromagnetic potential energy.

Chapter 2 The application of the photons' inertia in cosmology[14]

Section 1 Doppler shift

According υ =C/2D, frequency of the electromagnetic radiation will changing by the relative velocity of photon C. That's Doppler shift. Meanwhile C/D means the number of the photon passed in unit time in fact. Count as υ =n/2 , n is the number of the photon passed in unit time.

Section 2 Phenomena in an accelerating universe

Assuming that the universe is expanding at an increasing rate and endless.[15]

1. Phenomenon of one star

If star 1 is doing for a uniformly accelerated motion, there are simple formulas relating the quantities displacement s, initial velocity v0, acceleration a, final velocity v, time t, the speed of photon releasing at the first beginning v0+c, and displacement of the beginning photon s1.

$s=1/2*at^2+v0*t$

s1=（v0+c）*t

When s=s1

$1/2*at^2+v0*t=$（v0+c）*t

t=2c/a

Which means after time 2c/a, star1 will catch up with its own photon. The relative velocity of the photon with the star1 = v0+c-(at+v0)=-c.

If star1 has motion enough time, then there will always be a fake image in front of the star1. Which have the same spectral line but darker than the real star at the same distance.

This is the white dwarf[16].

2. Phenomenon of two star on the same way

Suppose star2 is a star that has the same motion as star1 but behind it. Their distance L, displacement s, initial velocity v0, acceleration a, final velocity v, time t, the speed of photon2 releasing from star2 at the first beginning v0+c, displacement of photon2 s2, the speed of photon2' releasing from star1 at the first beginning v0-c, displacement of photon2' s2'

When the photon2 first arrive the star1, their relative velocity
C2= v0+c-(at+v0)=c-at.
s2=L+s
（v0+c）*t =L+1/2*at^2 + v0*t
1/2*at^2 - c*t+L=0

<c
Redshift happened. And the star1 will saw the fake image of the star2 too.

When the photon2' first arrive the star2, their relative velocity
C2'= v0-c-(at+v0)=-c-at
s2'= s-L
（v0-c）*t = 1/2*at^2 + v0*t-L
1/2*at^2 + c*t-L=0

>c
Blueshift happened. And the star2 will saw the fake image of the star1 too.

According υ 2=C2/2D=, by the longer of distance L, the frequency of electromagnetic radiation from the star2 will decrease and become into Infrared, microwave, radio wave from visible light. Till their aL is big enough that the photons released from star2 will never arrive star1. And this is the limit of observation.
According υ 2'=C2'/2D=, by the longer of distance L, the frequency of electromagnetic radiation from the star1 will increase and become into ultraviolet, X-ray and gamma ray from visible light.

3. Phenomenon of two star on the same way but have different birth time
Suppose star3 is a star that has the same motion as star1 but born earlier. Their interval of birth time T, the speed of photon3 releasing forward from star3 at the first beginning c, displacement of photon3 s3, displacement of star1 s, acceleration a, , time of star1's motion t.
s3=c*(T+t),
s=1/2*at^2 ,t>0, T>0.
When star1 catch up with the photon3,
s=s3
c*(T+t)= 1/2*at^2
(1/2*at-c)t=cT
Because T>0, t>2c/a. When t>2c/a, t will increase along with the T.
At this moment, the relative velocity of the photon with the star3 C=c-at.
When t>2c/a, C<-c, and will increase along with the t, means will increase along with the T.
According υ =C/2D, frequency of the electromagnetic radiation from star3 catch up by star1 at the first time will increase along with their interval of birth time T. Turn into ultraviolet, X-ray and gamma ray.

Star3 will being a supernova to star1 when their interval of birth time is long enough. This is one condition of the supernova, which will outburst without a sign.

As the star3 is accelerating, the photons releasing forward later will get a bigger speed than earlier. Which means the later photons will catch up with the earlier photons sooner or later. And before they catch up, those photons will gather together incredibly. If they were crossed at this moment, it will be a supernova too, which is suddenly broke out and then disappeared.

As the accelerate of the star3, the photons releasing backwards from star3 will motion away from their birth place. Which means when their interval of birth time is long enough, those photons will be far away enough from their birth place, and when star1 catch up with them, those photons will be slow enough to become into Blueshift. This is another condition of Blueshift, whose relative velocity of photons will change by time.

4. Phenomenon of two star not the same way but the same direction

If star3 is a star that has the same motion as star1 but on parallel trajectory, and the connection between two stars perpendicular to their trajectory. There are simple formulas relating the quantities displacement s, distance between two stars L2, initial velocity v0, acceleration a, final velocity v, time t, the speed of photon3 releasing from star3 at the first beginning +, the angle of with is α .

When the photon3 catch up with the star1

t3= L2/(c*sin α)

their relative velocity

C3=+-(+)=

, Redshift happened.

And also Phenomenon1,2,3 will also happen too.

In fact, when the star releasing photons, the photons was released as a ball with expanding speed c and moving forward speed v. However the ball released later have a big forward speed, which means it will catch up with the earlier sooner or later although the earlier one is larger than the later one. And after contact, there will have a common border of this two ball, which means at this border there's two or more images of the same star changing by time. This is the Double star.

5. Conclusion

The image of other stars for star1, which changing along with the time, depends on the difference of their birth time, motion's acceleration and direction.

Together with the Blueshift in phenomenon2, those stars born earlier and move in front are all

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