Space Time Fabric Curve in Velocity (Kepler's Law)

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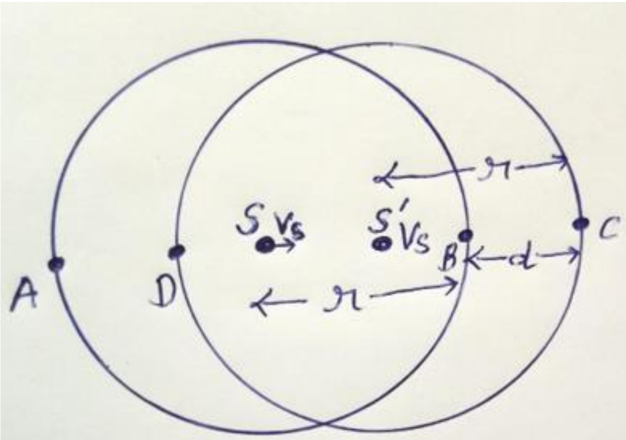
Abstract: ***According to Einstein everybody make a curve in space. This curve is the case of gravity. A large body make a large curve. If the body is in velocity than space time curve should be small in the direction of velocity and large in the opposite direction.***

Keywords: variation in planet's orbit according to the velocity of star.

1. Introduction

Let A star is in velocity and before the velocity the star had a spherical space time curve

Hence if the star in rest then every planet orbit the star in circular path.



Let the star is going with the velocity vs. Hence the planet is also going the velocity vs. Because the planets is also orbiting with sun in galaxy. So all solar system has same velocity around the centre of galaxy(the velocity of star is greater than the velocity of planet). Because the sun is also orbit the centre of galaxy.

Let at any time the planet and the star are at B and S point respectively. Then the light release in all directions from the Sun and the light reaches at the planet when the planet and the star get d distance. After get d distance the star and the planet reaches at S' and C point respectively. Let time taken from B to C is T than

Distance taken by the planet d=VsT

Distance taken by the light=r+VsT
=CT

Then

$$r + V_s T = cT$$

$$T = \frac{r + V_s T}{C} \qquad \ldots\ldots\ldots 1$$

Or

$$CT - V_s T = r$$
$$T(C - V_s) = r$$

$$T = \frac{r}{C - V_s} \qquad \ldots\ldots\ldots\ldots\ldots 2$$

In Opposite direction of velocity.
Late time taken from A to D is T'

Then
Distance taken by the planet=VsT'
Distance taken by the light=CT'

$$r = V_s T' + CT'$$

$$CT' = r - V_s T'$$

$$T' = \frac{r - V_s T'}{C} \qquad \ldots\ldots\ldots\ldots 3$$

$$CT' + V_s T' = r$$

$$T' = \frac{r}{C + V_s}$$

When the star is in rest state. The planet orbit the star in circular path. And get the planet light at all point of circular path in same time from Star. What when the star is in velocity. Get the planet light at all point of circular path in different (according to equation 1 and 3). Same distance and different time for light. This is not possible according to theory of relativity.

To balance it the planets change their orbits. And increase the distance in opposite side of star's velocity.

So

T=T'

This is possible only when large time take a large distance. So let at distance R (r change in R) T=T'

Hence

$$\frac{r + V_s T}{C} = \frac{R - V_s T}{C}$$

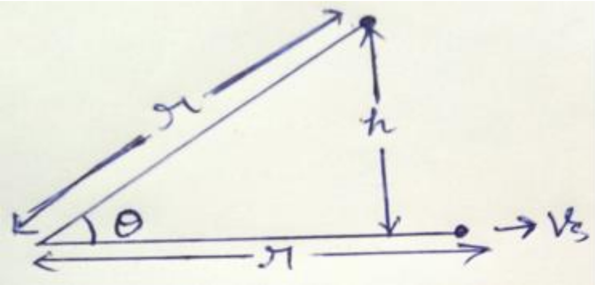
$$R = r + V_s T + V_s T$$

$$R = r + 2V_s T$$

Hence, In opposite direction of velocity the distance add 2VsT term

For the position of the planet at angle θ

Let the velocity of the star is Vs and the position of planet is at θ angle



Then at θ angle.

Velocity component = $V_s Cose\theta$

Now

$$speed = \frac{distance}{time}$$

$$C + V_s Cos\theta = \frac{r}{T} \qquad \ldots\ldots\ldots 4$$

Here, the velocity of light is greater than C, and the velocity of light should be C. To keep constant its velocity distance r will be decreased.

$$C = \frac{r - r'}{T}$$

Put the value of r by equation 4

$$C = \frac{CT + V_s Cos\theta T - r'}{T}$$

$$CT = CT + V_s cos\theta T - r'$$

$$r' = V_s Cos\theta T$$

At

$$\theta = 90$$

$$r' = V_s Cos90T$$

$$r' = 0$$

Hence, if the planet is rotating in the perpendicular direction of the star's direction, then the planet will orbit the star in circular path.

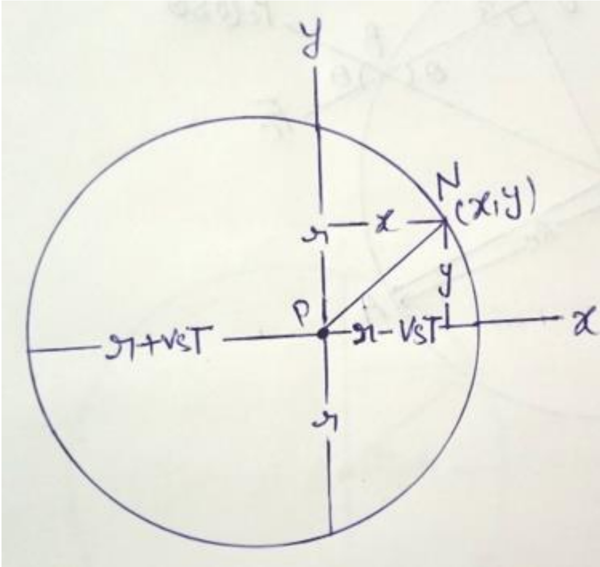
Hence, the path of planet around the star

Let N be a point on the planet path then

$$P = r - V_s Cos\theta t$$

$$P = r - \frac{V_s x}{r'} t$$

$$Cos\theta = \frac{x}{r'}$$



$$P = r - \frac{V_s x}{r'} . \frac{r'}{C} \qquad t = \frac{r'}{C}$$

$$P = r - \frac{V_s x}{C}$$

Put $P = \sqrt{x^2 + y^2}$

$$\sqrt{x^2 + y^2} = r - \frac{V_s x}{C}$$

Squaring both side side

$$x^2 + y^2 = \left(r - \frac{V_s x}{C}\right)^2$$

$$x^2 + y^2 = r^2 + \frac{V_s^2 x^2}{C^2} - \frac{2rV_s x}{C}$$

$$y^2 = r^2 + \frac{V_s^2 x^2}{C^2} - \frac{2rV_s x}{C} - x^2 \qquad \ldots\ldots 5$$

This is the Path of the planet around the star

The orbit of planet is depend upon the velocity of star and the angle of orbit with the star's velocity. We can see different orbit with different velocity of star.

According to Kepler's law the earth moves around the sun in electrical path

The equation of ellipse is

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

Or

$$b^2 x^2 + a^2 y^2 = a^2 b^2 \qquad \ldots\ldots 6$$

Now by equation 5

$$y^2 = r^2 + \frac{V_s^2 x^2}{c^2} - \frac{2rV_s x}{c} - x^2$$
$$c^2 y^2 = c^2 r^2 + V_s^2 x^2 - 2rV_s xc - c^2 x^2$$
$$c^2 y^2 = x^2 (V_s^2 - c^2) + c^2 r^2 - 2rV_s xc$$
$$c^2 y^2 + (c^2 - V_s^2) x^2 = c^2 r^2 - 2rV_s xc$$

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Condition for elliptical path of our solar system.

$$c^2r^2 - 2rV_sxc = c^2(c^2 - V_s^2)$$
$$c^2r^2 - 2rV_sxc = c^4 - c^2V_s^2$$
$$c^2r^2 - c^4 + c^2V_s^2 = 2rV_sxc$$
$$c(r^2 + V_s^2) - c^3 = 2rV_sx$$
$$c(r^2 + V_s^2 - c^2) = 2rV_sx \qquad \dots.7$$

By equation

$$cos\theta = \frac{x}{r'}$$

Then

$$x = r'cos\theta$$

Put in equation 7

$$c(r^2 + V_s^2 - c^2) = 2rV_scos\theta r'$$
$$r' = V_scos\theta T$$

Now

$$c(r^2 + V_s^2 - c^2) = 2rV_scos\theta V_scos\theta T$$
$$c(r^2 + V_s^2 - c^2) = 2rV_s^2\cos^2\theta\ T$$
$$\text{Cos}^2\theta\ = \frac{c(r^2 + V_s^2 - c^2)}{2rV_s^2T}$$

This angle required for elliptical path

Where T is time taken by light from star to planet

This angle is between velocity of sun's direction and the orbit of planet.

Application

1) To determine the velocity of star.
2) Important information in gravity.
3) Find the orbit of planet around the star.
4) To get the information about the solar system and galaxy.
5) Kepler's law are use in only our solar system. But this theory is use for all solar systems in universe.
6) This theory tells us about the nature of space time fabric carve.

References

[1] Einstein, A. (1915) On the General theory of Relativity. Sitzungsber. Preuss. Akad. Wiss. Berlin(math. phys.),1915,778-786.

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