Absolute motion

Galilean relativity (hence Einstein's) not correct

March 03, 2013

Henok Tadesse, Electrical Engineer, BSc.

Address: Ethiopia, Debrezeit, Mobile phone: +251 910 751339

e-mail: *entkidmt@yahoo.com* or wchmar@gmail.com

Abstract

The concept of relativity of motion was first introduced by Galileo. In his principle of invariance he stated that the laws of motion are the same in all inertial frames. He used the Galileo's ship thought experiment in his argument, among other arguments. This principle of invariance was then modified by Einstein (special relativity), which included the speed of light to be invariant in all inertial frames. Therefore, the relativity theory we know today is based on Galileo's principle of invariance. There is no sound argument yet in support of relativity of motion. Simply because an observer hasn't been able to identify between illusion of motion and real motion cannot be taken as a sound argument to support relativity of motion. However, in the usual arguments of relativity of motion, to detect absolute motion is difficult. In this paper, a sound argument against Galileo's principle of invariance will be presented, which will prove the notion of absolute motion to be correct and disprove relativity of motion, both Galileo's and Einstein's.

Discussion

Imagine two hypothetical identical solar systems in space, initially at rest relative to each other, separated by some distance, with an observer in each solar system. For simplicity, assume that each solar system has one sun and one planet only, the two solar systems do not affect each other, and that the planetary orbits are both circular.

Solar system (A), Solar system (B), Sun of solar system A (S_A), Sun of solar system B (S_B), Planet of solar system A (P_A), Planet of solar system B (P_B), Observer in solar system A (O_A), Observer in solar system B (O_B).

The two observers use reference frames fixed to the center of their respective suns.

The two observers now formulate the law of gravitation governing the phenomena they observe: the planets revolve around their respective suns, in circular orbits. Since the orbit is circular, the law of gravitation they formulate will be in its simplest form. So they formulated the law exactly as they observed, and observed the orbit exactly as the law predicts: circular orbit. Circular orbit is the simplest shape of orbit and hence can be explained by the law of gravitation in its simplest form.

If the orbits were non circular, the observers would not be able to formulate a simple law that explains the non circular orbit. They would not be able to explain why the planet is closer to the sun on one side and farther away on the other side, even though they discovered that gravitational attraction was the cause of the revolution. Abstraction is not allowed here. The law should be formulated exactly as observed and it should predict the phenomena exactly: *Formulate as observed and observe as formulated* . So the observers were lucky that they observed nature in its simplest form and hence formulated a simple law governing it.

Now assume that the sun of solar system B (S_B) is made to move away relative to the sun of solar system A (S_A) by some force applied on S_B, by some means. Now, as S_B starts accelerating, its planet (P_B) will also start to follow it. As S_B accelerates forward, P_B will follow it but will be left behind. P_B has to 'work hard' to catch up with S_B . P_B has to make two kinds of motion: it should make forward translational motion and also revolve around S_B. As S_B accelerates, the observer in solar system B observes that the orbit of the planet is being distorted and not stable. He observes that the orbit is continuously being closer to the sun on the left side and farther on the right side, and continuously increasing orbit size on average, and hence a non stable orbit.

After some time, say a time required for about one hundred revolutions of the planet around the sun, assume that S_B finally ceases to accelerate (the force is removed) and settles on a final constant velocity (relative to S_A). Now the orbit of P_B around S_B will become stable, at the moment that the acceleration ceased. What would be the shape of the final stable orbit? Will the orbit change back to its original circular shape and smaller size, just as the acceleration ceased ? No. The orbit will be of distorted (non circular) shape and bigger? in size on average. (the qualitative analysis will be presented later)

The complete dynamics will not be discussed here, but can be done by anybody who knows Newton's laws of motion and gravitation, the laws of conservation of mechanical energy etc.

Now we come back to the relative velocity of the two solar systems. The two solar systems are in uniform rectilinear motion relative to each other, after the acceleration has ceased. Hence the two reference frames attached to the sun of each solar system are also in uniform rectilinear relative motion.

Let the observer in solar system B (O_B) try to explain the orbital shape in his home solar system B. He remembers the simple and universal law of gravitation which he formulated before the acceleration, while solar systems A and B were at rest relative to each other. Can he explain the distorted (complex) shape of the orbit by his simple law of gravitation now? The simple law of gravitation he knows predicts a simple shape of the planetary orbit: circular. As the average size of the orbit has also increased, the gravitational constant also appeared to be no more equal to that stated in the law: it appears to be smaller on average.

Therefore, O_B can no more apply the simple, convenient and beautiful law of gravitation he knew. Its beauty was its simplicity.

He has to reformulate a new 'law' in his reference frame that governs what he is observing: distorted orbit. But this 'law' will be too complex, very specific (non universal) and cannot be applied to predict phenomena if any disturbance happens. The only 'law' of gravitation he can formulate is that gravitation is responsible for the revolution and a record of the (empirical) data on the position and velocity of the planet on every direction of the sun (the shape of the orbit). And from this, he can predict the moment of time when the planet passes through a given point in its orbit. He cannot predict, for example, what happens if the planet was given a momentary push away from its orbit by some external factor. What simple law of gravitation can be formulated in his own reference frame that can explain the distorted orbital shape he is observing?

How then can that convenient, simple, universal law of gravitation be used to predict the non-circular orbit that O_B is observing? Why was O_B no more able to predict the distorted planetary orbit by applying the simple law of gravitation he knew in his reference frame (fixed to the center of S_B) ?

Hypothesis:

The root problem was that the simple law of gravitation was observed and formulated when solar system B was at rest relative to solar system A. Or, the problem was that the reference frame used by O_B (originally, when he formulated the law) was attached to solar system B, and hence moved with it. A law should always be applied in a reference frame with respect to which it was defined.

Therefore, we conclude that the reference frame should not be fixed with the solar system B. O_B can predict the circular orbit he is observing only if he didn't fix his reference frame to the sun. He should have fixed his reference frame at its original point in space. But he can't know that point now. What can he do?

But he can use the reference frame of solar system A! because solar system B was at rest relative to solar system A when he formulated and observed the simple law of gravitation, because the law of gravitation was observed similarly in both solar systems then.

Therefore, O_B can use the reference frame fixed to the center of solar system A to correctly predict the orbit of P_B around S_B. But he should make sure that the orbit in solar system A is still circular. *This is important and fundamental!* O_B can simply call O_A to check this. O_B can then use some ideal precision distance and angle measuring device to know the position of S_B and P_B at each instant of time in the reference frame of O_A and hence determine the orbit of P_B.

Reference frames, once they are used to define a law of motion, should be fixed in space at that same point, if that law is to be universally applied. But how can we know the origin of the reference frame in space once we have moved from there? How can we know that the reference frame has not moved from that position and is at rest relative to that point? There is no fundamental way of knowing this in space where everything is moving.

Therefore, we use, for instance in the solar system case above, the reference frame fixed to a physical system in which the simple law of gravitation is still being observed (solar system A).

Therefore, by applying the simple law of gravitation in the reference frame of A, the distorted shape of the orbit of P_B around S_B can be predicted correctly.

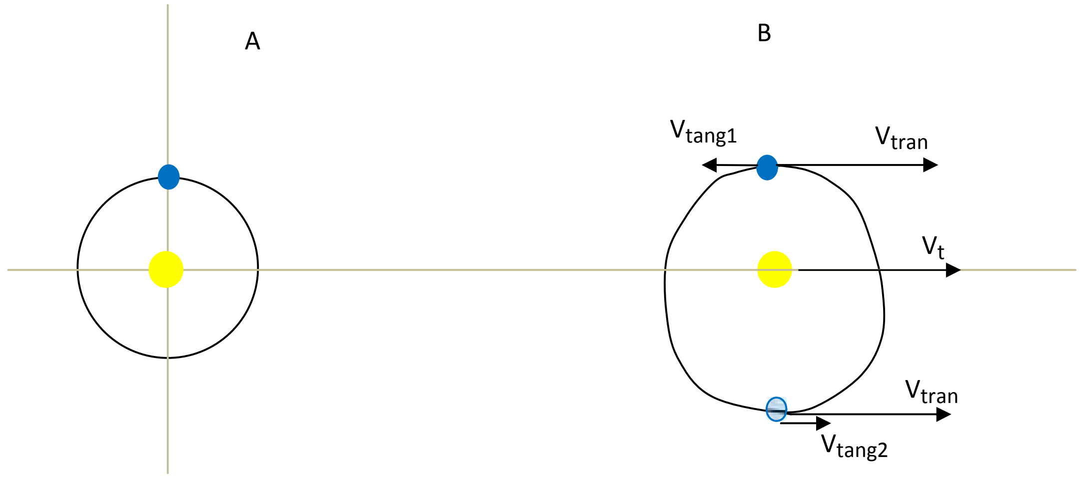
Qualitative analysis [1] on the shape of the distorted orbital shape

The non circular orbit of P_B around S_B can be predicted correctly by applying the simple law of gravitation in the reference frame fixed to the center of the sun of solar system A. Here only a qualitative analysis will be presented.

Why is the orbital shape in solar system B non circular?

We assume that O_A solves the orbit problem of solar system B.
Imagine O_A is looking towards solar system B. Assume that the sense of revolution of P_B around S_B is such that P_B approaches towards O_A on the left side of S_B and recedes away from O_A on the right side of S_B.

The resultant velocity of P_B in the reference frame of observer A is the vector sum of the common translational velocity of solar system B (which is just the velocity of S_B) and the tangential velocity of P_B due to its revolution around S_B.



Here we consider only two points: the left side of S_B and the right side of S_B.

The translational velocity both on the left side and the right side of S_B is the same in magnitude and direction.

Thus, on the left side of S_B (as seen by observer A), the resultant velocity of S_B (in the reference frame of A) is smaller than the resultant velocity on the right side of S_B. This is because, on the left side the translational and tangential velocities are opposite in direction (hence subtract), where as they are in the same direction on the right side (hence add).

As the (resultant) velocity is smaller on the left side of S_B, the gravitational pull of S_B on P_B will overcome the centrifugal force, resulting in decreased orbit size on the left size. On the right side of S_B, the resultant velocity of P_B is greater and hence the increased centrifugal force will result in increased orbit size on the right side.

Quantitative analysis will predict the exact shape of the orbit.

<u>Galileo's relativity (hence Einstein's) is not correct. Motion is fundamentally absolute</u>

" Galilean invariance or Galilean relativity states that the laws of motion are the same in all inertial frames" (from Wikipedia)

"any two observers moving at constant speed and direction with respect to one another will obtain the same results for all mechanical experiments"

From the analysis of the two solar systems example above, we see that the simple law of gravitation didn't apply correctly to solar system B in the reference frame of observer B (that is fixed to the center of S_B, and hence moving with it).

Therefore, Galileo's hypothesis that the laws of motion are the same in all inertial frames is wrong. The reference frames which were fixed to the center of each solar system were in uniform rectilinear relative motion and yet the law of gravitation was not the same in both reference frames.

The law of gravitation was observed in its simplest form in the reference frame fixed to solar system A, but was distorted in the reference frame fixed to and was moving with solar system B.

The laws of motion are the same only in reference frames that are at rest relative to each other.

Therefore, the laws of motion and gravitation are not the same in reference frames that are in relative motion. And the simplest laws of motion (including gravitation) are observed in absolute reference frames.

Motion is fundamentally absolute. The laws of motion are observed in their simplest forms in physical systems that are at absolute rest

How can we know that the sun of solar system A is at absolute rest. The solar system A is known to be at absolute rest because of its circular orbit. Circular orbit is the simplest form of revolution.

How does an observer know that if he/she is in (absolute) motion

Imagine a third observer floating in space in the solar system example discussed previously. How does he know that he is absolutely moving or at rest? To know his absolute velocity in space, the observer sees that the orbit of solar system A is circular and hence he concludes that solar system A is at absolute rest. He then measures his velocity relative to solar system A. That will be his absolute velocity in space.

Newton's laws of motion and gravitation should be redefined with respect to absolute reference frame

Consequence on Einstein's relativity

As Einstein's relativity is based on the two postulates, the first of which is Galilean principle of invariance, which has been shown to be incorrect in the discussion above, hence Einstein's relativity is not also correct.

Evidence of absolute motion

We know that the orbits in our solar system are not circular and there has been no explanation so far. The noncircular orbits of our solar system is an evidence confirming absolute motion. We conclude that our solar system is in absolute motion in space. A mathematical model may be developed to determine our absolute speed in space, by observing the shape of the orbits in our solar system.

Conclusion

I think the solar system example above supports the view of absolute motion much better than those examples and arguments ('a person flying in an airplane not looking outside through the window', 'a person in a ship without windows moving on the sea with steady motion' etc) support the view of relative motion. The change in the laws of motion with absolute motion are harder to detect in the later examples that are used support relative motion.

So the laws of nature vary with the absolute and relative motion of the systems to which they apply, but it is not always easy to detect such changes. Contrary to this, the arguments and examples of Galileo's (and Einstein's) relativity make it even harder to detect these changes, for example, 'closed windows' etc.

References

1. http://vixra.org/pdf/1211.0076v1.pdf