Time

The Equivalence of Inertial and Gravitational Mass

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Abstract

Inertia, the force you feel pulling on you as you accelerate, and gravity – the force that attracts all. Are two separate and distinct phenomena, yet they share an equivalence which has yet to be explained. In this paper, we will show how and why inertial and gravitational mass are equivalent, and how time is the underlining mechanism that links and governs them. To accomplish this, we took a step back and reanalyzed the nature of time, which subsequently led us to an undeniable conclusion. One that finally reconciles gravity with quantum mechanics.

Background and Introduction

For almost four hundred years, from Galileo Galilei to Isaac Newton to Albert Einstein, mankind has endeavored to unlock the enigma of gravity. In 1915, Einstein published his Theory of General Relativity, suggesting there is a geometry to the fabric of space-time. In the paper, "Time – The Equivalence of Inertial and Gravitational Mass", a new methodology is examined, explaining the process of exactly what causes inertia and gravity, and introduces the supposition that gravity is not caused by the warping of space-time.

So, what exactly is gravity? In the earth-moon system, each body experiences a different magnitude of time dilation due to the different concentration of mass each body possesses. As such, earth's greater time dilation (mass), means it exists at a position in time that is slightly further in the future, than that of the moon's position in time. The moon, in the past, is drawn to the future located here at earth's center. Therefore, due to time dilation, gravity is the attraction between objects that are in different temporal locations, drawn together by the arrow of time.

Which brings us to inertia (or the inertial force). Relative to an outside observer, as you accelerate – your mass, gravitational field, and time dilation increase proportionally to your rate of acceleration. This increase subsequently moves you forward in time, relative to any outside stationary clocks. These stationary clocks, now in your past, see you as a growing temporal charge and the path of least resistance to the future. Hence, these clocks are drawn to and pull on you from the opposite direction of acceleration. This is inertia, an accelerating mass creating a rising gradient of time dilation, thereby attracting stationary clocks in the past, as its own clock moves forward in time.

Therefore, time is the impetus of inertia and gravity, and its equivalence. Both manifestations are caused by bodies that are separated in time – drawn together by the charge of time.

Figure 1. depicts attraction caused by temporal charge. Black holes with high magnitudes of time dilation are represented in space-time. Blue regions represent the future, the red regions the past. Near any massive object (such as black holes), clocks point in its direction as they are monopoles of extreme temporal charge.

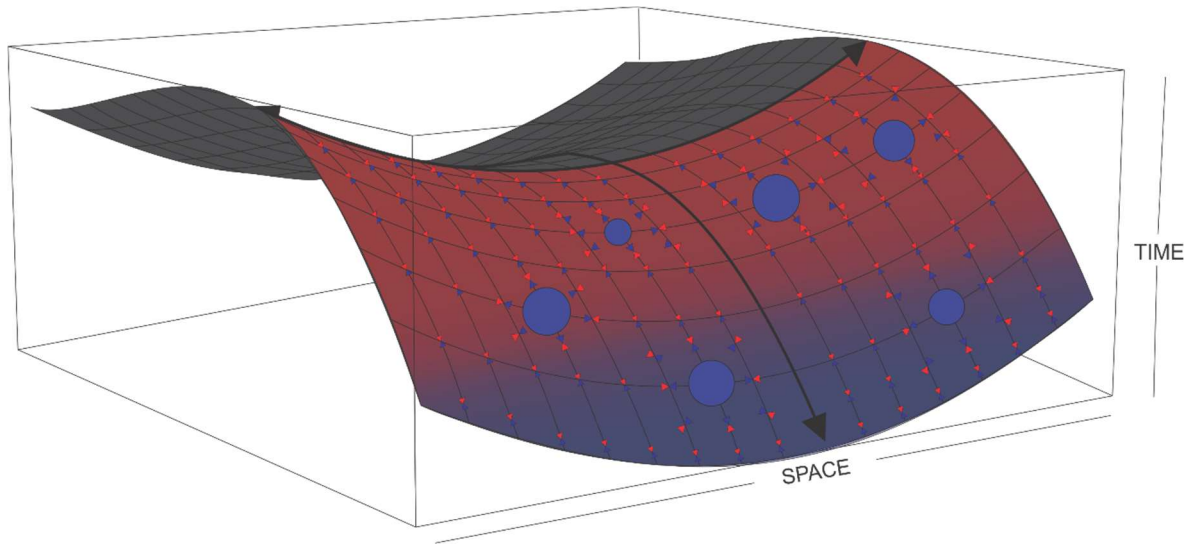

Figure 1. Monopoles of extreme temporal charge (black holes) attracting past clocks.

To measure temporal charge and the attraction it causes between objects in different temporal locations, we need to identify the absolute position in time of every object. The further in time an object's position, the greater its temporal charge. As such, the higher the magnitude of temporal charge in a system of objects (mass), the greater the product of attraction between those objects, divided by the spatial distance squared separating them.

To locate this absolute temporal position, we need a common lighthouse in time that is the same in all reference frames. For this, we use the Big Bang, as every object in time is an absolute distance away from it, depending on the amount of time dilation of that object. Therefore, by measuring the magnitude of an object's time dilation, we can determine that object's distance to the Big Bang, thus its absolute position in time. Although it should be noted, every object in the universe is continuously moving forward in time, and not fixed at a static point. However, every object's absolute distance to the Big Bang is changing constantly, and at the same *simultaneous* rate. Hence, the gauge is still valid.

So, to calculate the absolute position in time for an object, we use the following function. The greater the velocity of an object, or the subsequent velocity needed to escape the gravitational field of an object in question, the greater that object's time dilation. Therefore, by measuring either velocity as a function of the speed of light, we can determine the amount of time dilation for that object, also as a function of the speed of light. This, in turn, corresponds to the object's distance to the Big Bang, hence its absolute temporal position (charge), and we denote this value R0 (r – naught). Figure 2.

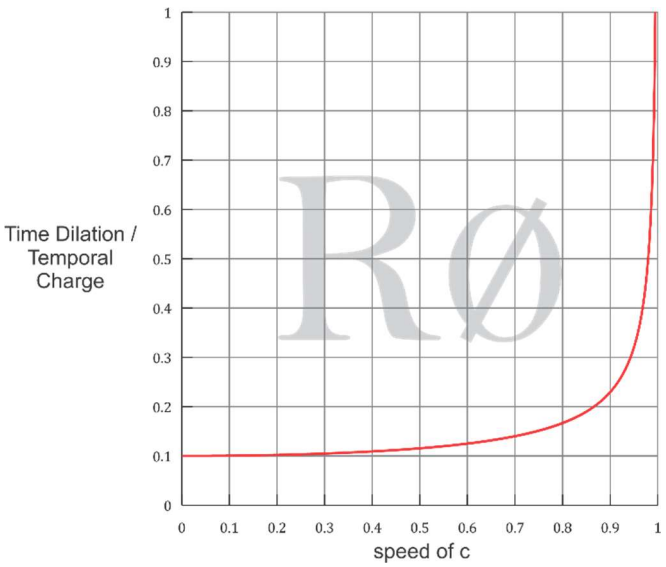

Figure 2. R0 (r – naught)

$$R\emptyset = 1 - \sqrt{1 - {}^{v^2}/_{c^2}}$$

Where

v = velocity from 0.0 – 1.0 of c

c = 1 (the speed of light)

R0 = amount of time dilation measured as 0.0 – 1.0 (1.0 = time dilation of a black hole)

The closer an object's R0 is to 1, the higher its subsequent time dilation. Additionally, as mass and time are intrinsically woven together, we define mass in a new equation incorporating time and its interaction with mass in the following term. This equation signifies how mass increases proportionally to R0, which is the amount of time dilation (temporal charge) present within mass.

$$m = \frac{\left(\sqrt{2R\emptyset - R\emptyset^2} \cdot c\right)^2 r}{2G}$$

Where

R0 = amount of time dilation measured as 0.0 – 1.0 (1.0 = time dilation of a black hole)

c = 299792458 (speed of light in meters)

r = radius of object in meters

G = gravitational constant

m = amount of mass in kg

Sample Equations

1. To find the R0 of earth, we convert its escape velocity to a percentage of c. 11186 / 299792458 = .0000373125 % of c, we then input this value into our equation for R0.

$$.0000000007 = 1 - \sqrt{1 - \frac{.0000373125^2}{1^2}}$$

Given earth's R0 and radius, we can calculate its mass in kg

$$6.006*10\text{^}24 = \frac{\left(\sqrt{2_{.0000000007 - .0000000007^2}} \cdot c\right)^2 6.371*10\text{^}6}{2G}$$

2. To find the R0 of a neutron star, we again convert its escape velocity to a percentage of c. 125000000 / 299792458 = .416955119 % of c, we then input this value into our equation for R0.

$$0.0910729244 = 1 - \sqrt{1 - \frac{.416955119^2}{1^2}}$$

Given the neutron star's R0 and a radius of 10 km, we can calculate its mass in kg

$$1.170*10\text{^}30 = \frac{\left(\sqrt{2_{.0910729244 - .0910729244^2}} \cdot c\right)^2 10000}{2G}$$

3. Using the formula for gravitation, we can calculate the gravitational force (in newton's) between the two bodies when they are a distance of 1 million meters apart.

G = gravitational constant

$$4.688*10\text{^}32 = G\frac{(1.170*10\text{^}30)\ (6.006*10\text{^}24)}{1000000^2}$$

Conclusions

Thus, we have conclusively shown how and why inertia and gravitational mass are equivalent. What gravity is, and how time is the underlining mechanism responsible for each phenomenon.

The following are conclusions of this theory.

1. Inertia and gravity is the attraction between objects that are in different temporal locations. All clocks seek the path of least resistance to move forward in time.

2. Gravitational lensing and tidal force are caused by clocks being drawn to a common future. Not by the curvature of space-time.

3. Anything which experiences the same amount of time dilation has the same clock and exists at the same absolute now, no matter where they are spatially in the universe.

4. Space and time are not woven into a single 1 to 1 fabric of space-time. An object can be at a given distance away spatially but exist at a different location temporally. For example, if the sun was converted into a black hole. Spatially it would be 149 billion meters away. However, temporally the black hole would exist in the far future, due to its extreme time dilation. Hence, space and time are not woven into a uniform fabric. Time is a separate dimension from that of 3 – dimensional space, with its own set of coordinates. As such, any "space-time" coordinate indicating time should be a complex number.

5. Gravitational acceleration is the rate at which an object falls into the future at that region, which is proportional to R0. On earth, that rate is 9.807 m/s^2. Oppositely, anything exiting a gravitational field is traveling backward in time, and thereby loses energy in doing so. i.e. gravitational redshift.

$$m = \frac{\left(\sqrt{2R\text{ø}\text{-}R\text{ø}^2}\cdot c\right)^2 r}{2G}$$

6. To reconcile gravity with quantum mechanics, a boson for gravity needs to exist – the graviton. However, gravity – the "warping" of space-time does not exist. As such, the above equation is significant, given $E = mc^2$, it indicates that time is energy woven into mass. Thus, what has been discovered is the quantum field of time – describing R0 as a boson for time. This field and its excitation are responsible for imbuing mass with energy, time dilation as it is accelerated or accumulated in a volume of space, and subsequently transporting mass forward in time. R0 is literally entropy itself.

$$0 = \frac{\left(\sqrt{2(0.00)\text{-}(0.00)^2}\cdot c\right)^2 10000}{2G}$$

The equation also indicates that regardless of radius, anything which experiences zero time, also experiences zero mass. e.g. the photon. Therefore, time is responsible for halting mass from moving at the speed of light, giving the universe depth. A universe would not exist if its particles of mass did not experience time. It would be over instantaneously. As such, what would be *the point*?

Acknowledgments

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References

No references on this topic seem to exist and no useful results could be found.