Acceleration Space with Applications to Cosmography, the Possibility of New Phenomena in Certain Opposed Force Exotic Matter Arrangements, and Free Acceleration

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With respect to the concept of gravitational curvature outlined in [1], can we not say that an "acceleration field" is more fundamental than a force field? All objects in a room cancel out by mass to give the same acceleration down. And all objects at radius r around a body are accelerated at the same rate. Isn't it more spatially related rather than a property of masses and forces? What matters for acceleration is only the object toward which acceleration is being calculated, that is, its distance and mass.

Although gravitational acceleration is not proper, Einsteinian, or relativistic acceleration, because a bead attached to a gravitationally accelerated body would not swing back, analogous to an accelerometer, we instead should think of it rather as a false *force*, as some part of the object should swing back, as if hit by something, and the accelerometer as a "forcemeter".

What we now call force meters are springs that measure forces pulling down by weight in units of Newton's. What they actually measure is the force on the attached *object* pulling down, or actually the pull on the meter up with the addition of the weight (that is, the repulsion of the ground or holder upward against the natural curvature toward falling). And the "forcemeter" that we know as an accelerometer measures force on itself by the same principle, but with a lighter, more "bead string-like" "spring" that also has direction. And in the case of a smartphone with an accelerometer lying on the floor, what is measured is the force of repulsion of the ground pushing up against the natural curve of gravity. This should then be amended and accelerometers renamed forcemeters, and the measurement expressed in a force vector. Perhaps if the mass is not known it can simply be expressed as "X * 9.8 m/s^2". Accelerometers operate on the same "spring" principle with a known resistance, so it is calculating force on the string-like part inside, so force should be obtainable, rather than change in velocity.

In the same way, a weight scale measures the force repulsing it and a person on it, from the ground. The accelerometer does not measure acceleration in gravity fall, so goes the point of making the distinction. A "true accelerometer" would measure it, although it would be acceleration without "force".

There are then three possible concepts of curvature: the stress-energy tensor, the large-scale structure of the universe, and the kind described here. And it is proposed here that it has a physical meaning. The three concepts can be combined into one if we think of the curvature as extra or less space. As for example happens on the Earth's surface as two parallel directions converge forward because there is a convex curvature. In the same way that light is deflected around a gravity source, it is also refracted in a changing medium, so curvature can be thought of as density. We can think of the light's incident angle with respect to the acceleration angle as incident angle relative to a changing medium and acceleration magnitude as density. Einstein also believed that light shot from a gravitational body should start off with a speed less than c. Rather the speed of light should decrease headed toward a gravity body as we get closer to it.

As in Einstein's proposal of 1911 of the variation of the speed of light: "From the just proved assertion, that the speed of light in a gravity field is a function of position, it is easily deduced from Huygens's principle that light rays propagating at right angles to the gravity field must experience curvature." And in a subsequent 1912 paper: “The principle of the constancy of the speed of light can be kept only when one restricts oneself to space-time regions of constant gravitational potential.”

Which makes sense if it is traveling through a denser medium or more space.

Einstein derived the general relativity equations that explained the precession of Mercury, which may serve as a curvature constant in tuning the parameters. In the same way that the curvature of the Earth was measured, in radians per meter, the curvature of the universe may be measured, and if the universe is convex as the Earth, then there should be a falling over the horizon in some sense. This may explain galaxies accelerating in the concept of “free acceleration”. Imagine if you are falling in orbit with the same speed as a box. If you then increase your speed a little bit, you would experience an ever increasing acceleration in relation to the box in relation to your velocity. This is akin to moving to the Earth at a slightly greater speed, leading to a faster increase in acceleration if we are ahead.

Even reactive or repulsive proper acceleration is atom repulsion and attraction. So how is time dilation happening from the proper-not proper distinction.

If time happens slower under a greater repulsed ground gravity field, it might be understand in terms of a kind of acceleration heating of atoms. If atoms have certain atomic speeds or trajectories they maintain, after all if they travel at trillions of orbits per second or greater the effects of acceleration in a black hole or planet might result in slight differences in atomic scale reactions or retarded orbits. There are different understandings of what is heat, if something is compressed to a solid and tested by a thermometer. Perhaps time dilation on the macroscopic experiential reaction scale is akin to this speeding up. If gravitational direction compression acts as a force on atoms and orbitals and in some way changes the orbit or some less understood property on this scale it can be absolutely determined that there is a time dilation effect. In empty space away from gravity the object would age faster (if still) which can be understood as atoms orbiting faster, to get places faster in less time.

Maybe they are *both* proper acceleration. If we could measure the number of orbits an electron is making around a nucleus trillions of times per second with a slight sideways increasing repulsion or movement of the nucleus maybe we can obtain a quantity approximation for the orbital speed, if we measure radians around a nucleus per time.

If we take the space-time interval:

$0 > x^2 - (c\ t)^2$
$(c\ t)^2 > x^2$
$c\ t > x$
$c > x/t$

Which gives the observed speed of a particle with respect to another's rest frame, might the time dilation be used to scale the particles actual speed, to give a different rate of time? This would mean there is a difference between particles traveling slower or just faster true speed but with time dilation, for example in the effect of the forces of acceleration and gravitation and electromagnetism. The measured speed might remain the same but the effect of acceleration forces would be different.

Time is not perpendicular to space but rather the hypotenuse in the time it would take to traverse it at the speed of light:

$$x^2 + y^2 = (c\ t)^2$$

That means that as the displacement approaches the maximum speed of light, the hypotenuse gets closer to the adjacent. Rather the hypotenuse is always greater than the displacement for ordinary matter.

$$x^2 + y^2 < (c\ t)^2$$

Which means the triangle hypotenuse goes up “out of the paper” in a new complex number or dimension. This is actually given by the space-time interval.

$$x^2 + y^2 + s^2 = (c\ t)^2$$

No matter what we do we cannot get a negative time or the radius of a sphere. For this we have to imagine the time length as an axis rather than measure between coordinates.

$$\sqrt{(x^2 + y^2 + s^2)} = c\ t$$

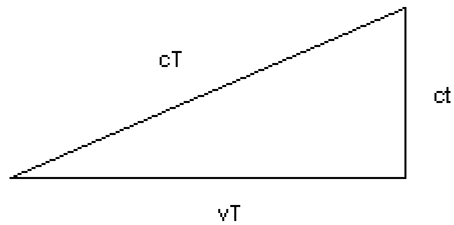
We have to go into imaginary space or imaginary offset to get a negative square. To do this, we would need imaginary acceleration. As will be shown, the time to accelerate is a gradient to measure between points of space or time in the resulting fields (the time to accelerate to X meters) and it will take further work to elucidate the arrangement of imaginary acceleration. Reverse acceleration mapping would be needed to get the arrangement to get the desired shape. An imaginary time might be achieved by being close enough within a sufficiently massive point-like mass, as in the gravitational time dilation equation. The exact Schwarzschild solution can be derived thusly by plugging the escape velocity equation into the time dilation equation:

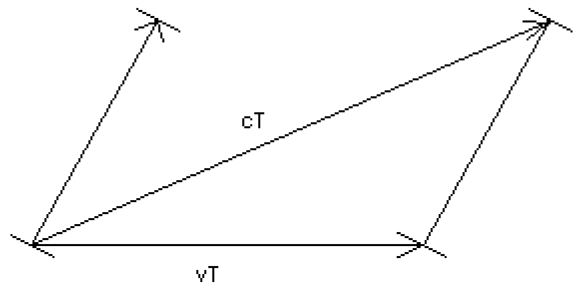
$$v^2 = 2GM/r$$
$$\gamma = \sqrt{(1 - v^2/c^2)} = \sqrt{(1 - 2GM/rc^2)}$$

Thus the effect of faster speed (younger) is in the same direction as smaller radius from a gravitational body.

The time dilation depends on the observed velocity, rather than acceleration, and two objects heading in different directions would symmetrically measure the other to be time-dilated, unless the other reversed velocity by accelerating and met up with the other, which would make the reversing-accelerating side “younger”. The velocity of the object would be added to the velocity of the particles. This can be explained by the simple principle: “the faster you go, the less time it takes to get there.”

What would be needed for a decomposition of time dilation into vector components is to realize that the relativistic triangle needs to be extended to cases beyond right triangles:





The equivalent relation should then be: $-\cos(\angle cT,vT)*2*cT*vT + (cT)^2 + (vT)^2 = (ct)^2$

The net orbital time dilation can be obtained by multiplying the gravitational and velocity contribution given the required orbital speed for a planet mass M at radius r. The time dilation factor would have three components, depending on the direction of light, and would be enough to explain paper [3] and make meaningful the possibility of reversing the role of time with space in a black hole.

The principle can be explained simply thusly: if you are located a distance r from a mass M, you must experience acceleration A, and if your time goes slower your acceleration and therefore force must scale accordingly, or else you would record a different gravitational constant. This would not make sense from the stationary mass's point of view, but it makes sense if we think of the scaled acceleration and forces as being those on the time-dilated side, as there is acceleration of you toward the mass, and the mass toward you, and together you have a combined acceleration. This might approach Newtonian laws at local conditions, but if we combine the gravitational time dilation component with the unaltered acceleration, we get:

$A_r = (2*G*M/r^2) * \sqrt{(1 - 2*G*M/rc^2)}$

Which looks reasonably well when graphed, and may be tested. Likewise, "... individual electrons describe corresponding parts of their orbits in times shorter for the [rest] system in the ratio : $\sqrt{(1 - v^2/c^2)}$" (Larmor 1897).

Given the 1-spatial dimension acceleration curve given in [1], we can count and integrate the curve angle from a starting point going from left to right to give a relative acceleration value and direction at any point.

If we interpret the "$1/t^2$" axis in [1] to be a rearrangement of the acceleration X in the form

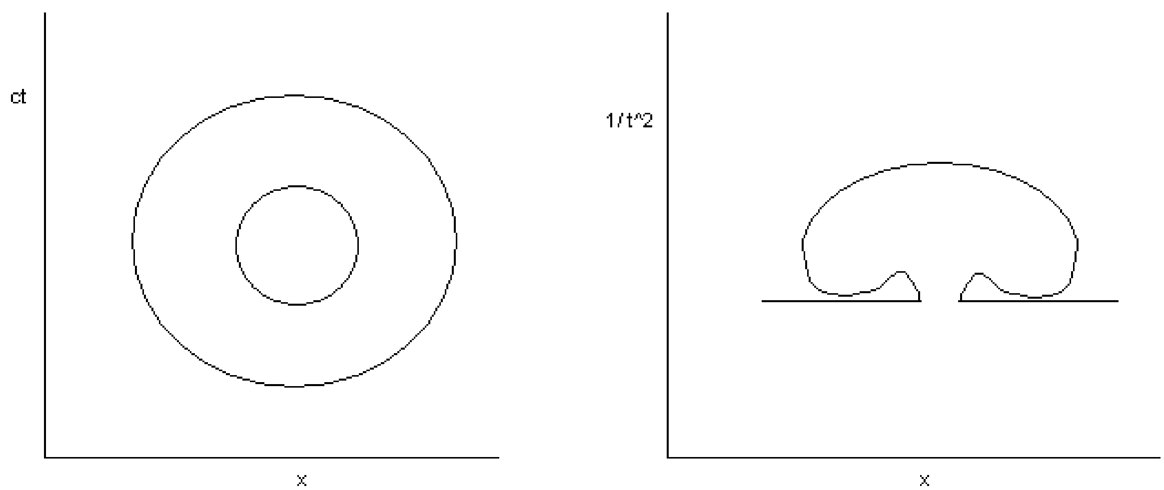
1 meter / Y light-meter^2

The geometric interpretation of the Y factor would be that there are two time dimensions. If expressed in light-seconds in the conversion

$Y * c^2$

The Y factor can be interpreted as a surface area.

As stated in [1], we can think of the curvature being given by not a "height" dimension but areas of "surface elements" at measuring points, where convex points indicate positive, repulsive curvature, and negative, concave points indicate attractive gravity wells.



Angle is in actuality the length of arcs around circles of unit radius, and thus a relation between two lengths, in an abstract sense, and exemplified by a right triangle in the most basic case, possible to be obtained in one of three possible ways depending on the trigonometric function. An angle is a physical relation between two vectors but the very quantity of an angle that grows is the arc length given by two side lengths, which give a single quantity if divided and are, but really is a unitless ratio, given by any two lengths with units. The angle then is a function of a ratio of two lengths that gives a new length. Really, radians should be a length measurement (arc length). In the same way, we can think of the "arc area" as giving an angle in 3 dimensions.

The surfaces given by the conversion can be thought of as a 3-dimensional cross section with the starting sample points in the walk space as angle and position parameters. The spacing between surfaces or sheets should be the same as in the walk space and depend on the base unit length used in the acceleration measurement, and can be thought of as the 3rd component in the volume.

What we want then is a conversion with the property that would give a flat angle when given an acceleration of zero, as in [1].

What then is a 360 degree turn in this curvature? First, if acceleration is greater, then the time to accelerate a fixed distance is less, giving a smaller Y factor. If acceleration is greater, the time to reach any speed will be less, and the interval of time of a constant change in position will be less (i.e., a higher speed). A 360 degree turn would have to depend on several factors.

The properties that would give the out-bent mushroom arrangement described in [1] would have to be further elucidated with a mathematical and graphical examination of the properties and resulting fields given by the arrangement described in [1].

If we have two extra time/length dimensions, can we use them as coordinates? In a sense, the corresponding point in the resulting space can be thought of as a "height" on a hill or potential to accelerate.

The resulting fields should be an approximation that grows more refined as the base length decreases, but remain invariant in shape.

A Y factor that grows at a square rate because of acceleration that is falling at a square rate with respect to radius would give perfectly spaced equidistant rings that grow to infinite size as radius approaches grows to infinity. Rather, around a single spherical mass, the resulting fields would give flat sheets.

There is a problem however: at points of zero acceleration as between two spherical masses, the Y factor should grow to infinity. What is needed then is a way to map the domain zero to infinity of the Y factor to a finite range of zero to some maximum constant, as perhaps a Planck acceleration or possibly the minimum black hole mass gravity acceleration at radius=1 (in meters/light-meters^2 or any other appropriate invariant units), using a conversion similar to the relativistic velocity addition equation.

$Yr = Yi*2 / (1 + Yi^2/Ym^2)$

The maximum acceleration constant of 2.5 solar masses would then be given so:

M minimum kilograms = 4.975×10^{30} kilograms

F force = $G * M * m / r^2$ =
G meters^3 per seconds^2 kilogram * M kilograms * m kilograms / r^2 light-seconds^2 =
6.674×10^{-11} meters^3/seconds^2 kilogram * 4.975×10^{30} kilograms * 1 kilograms / 1 light-seconds^2 =
3.3203×10^{20} kilograms meters^3 / seconds^2 light-seconds^2

A maximum acceleration = F / m =
3.3203×10^{20} kilograms meters^3 per seconds^2 light-seconds^2 / 1 kilograms =
3.3203×10^{20} meters^3 per seconds^2 light-seconds^2

1 light-second = 299,792,458 meters/second * 1 second

3.3203×10^{20} meters^3 per seconds^2 light-seconds^2 * 1 / 299,792,458^2 light-seconds^2 per meters^2 =
3694 meters per seconds^2

seconds / light-meter = 1 second / (1 meter / 299,792,458 meters/second) = 299,792,458

3694 meters per seconds^2 * 299,792,458^2 seconds^2 per light-meters^2 =
3.3203×10^{20} meters / light-meters^2

However, we must express the maximum constant acceleration as a Y factor, which gives a smaller value with a greater maximum acceleration constant. What is needed then is a *minimum* acceleration, which may for example be added to the measured acceleration before obtaining the Y factor. What this would give then with a single spherical mass then is larger and large flat sheets upwards with decreasing acceleration, but at a decreasing rate that approached a finite size.

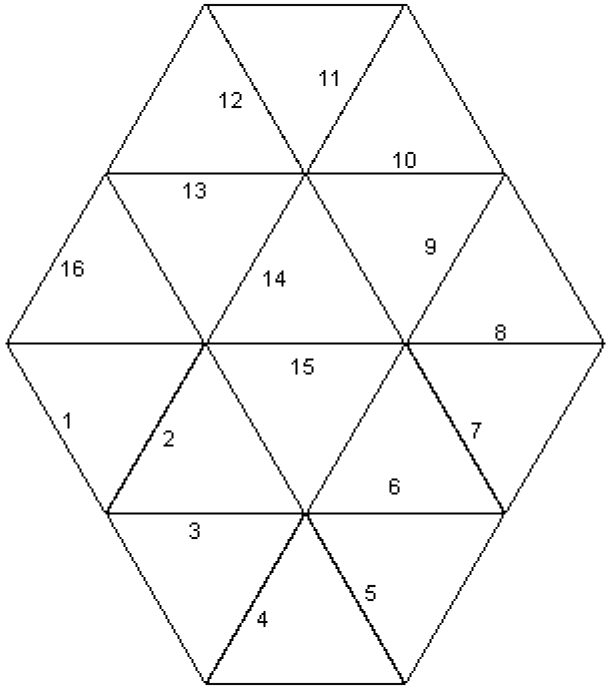
It is interesting then to consider what a box submerged in a spherical mass of proportional size would look like when mapped into the acceleration space.

In the repulsed dark matter container as in [1] then, two opposing acceleration fronts would give a sheet that is perpendicular to the acceleration vector to fold back on itself as it passed across the front.

Another possible problem area around points of zero acceleration is there is no vector direction, making determining a reflection or perpendicular angle vector impossible. The solution is to continue as close as possible after the zero point along the previous vector, and this is the what the limit approaches to as we approach the zero point from a certain angle and decrease the vector length.

The exact geometric method to create a representation of the fields can be expressed mathematically by using triangles.

What is needed, is for a triangle grid sheet starting from evenly spacing points to expand or “walk” the acceleration field at vectors perpendicular to the acceleration vectors. What this is then is a function of the acceleration vector angles that samples acceleration magnitudes, which produces new angles. The triangles in the resulting fields then must be fit to expand and contract and warp based on the area magnitudes given. There is always one triangle side free to fit all the areas, as can be proven in the following diagram:



We walk the acceleration field by shooting vectors at 60 degrees perpendicular to the acceleration vector at those points a unit of base length to give 6 new 60-60-60 degree triangles. Around a spherical mass, a sheet over top would curve around and closer together further along, until the paths go in opposite directions and unravel. Although the launch vectors have base length, the other connecting lengths of the triangles in the walk space will not be base length. This does not matter, as it is a logical part of the walk, and all that matters is that the shape remains invariant. More sampling points with uniform magnitude in the walk space in one area would give a greater area for the corresponding surface elements in the resulting fields, and may make parts arbitrarily large. What is needed is for the area of the resulting sample triangles to be measured and used to scale the acceleration space triangles.

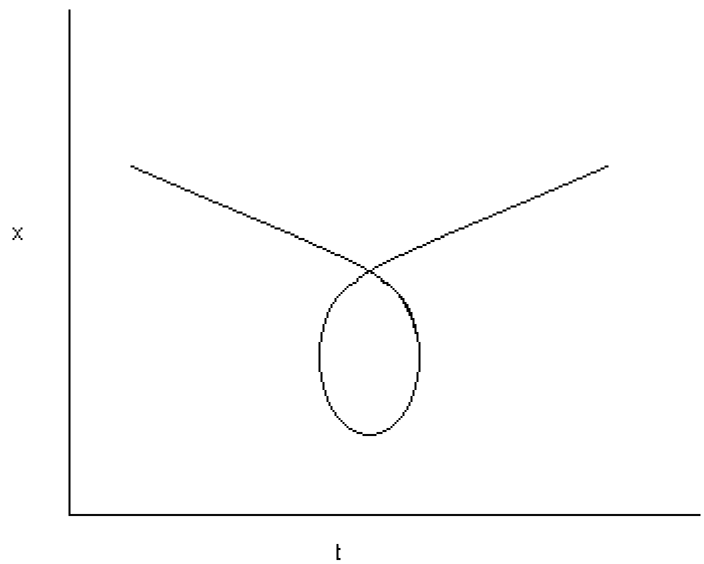
A flat acceleration upward would give a flat sheet perpendicular to the acceleration in the walk space and in the resulting fields would give flat sheets also, with equal acceleration magnitude and thus area at each point, with no curvature. The curvature would be given by connecting neighbor surface elements between sheets, as the sheets would grow larger upwards with decreasing acceleration magnitude, and the lines connecting neighbors would bend outward.

We must also know where to allocate the extra space as we add surface area to the resulting sheets. With respect to the acceleration vector in the walk space and the relative angle along the perpendicular curve, we should curve the resulting field sheet down with a concave angle around a spherical mass, with respect to “our” up of the starting sample point in the walk space.

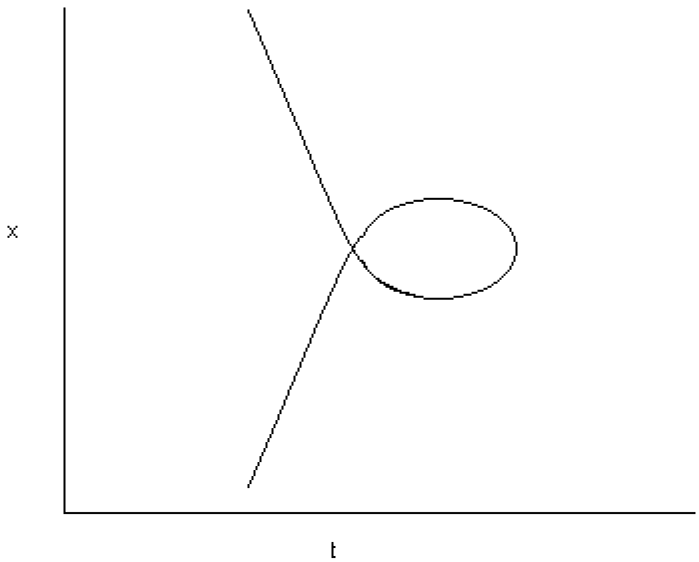
Thus, the acceleration magnitude is now (inverse) area. And the vector is now still a vector in the walk space, but the (inverse) area now gives a curvature angle. The lengths have effectively been switched with the angles.

A sphere mass with sample start points going through and both sides gives sheets that increase in size in both directions from a fixed size in the middle, to a fixed larger sides infinitely far at the sides at a decreasing rate. From the side it gives exactly a pinched downward curve toward the center that levels out on the sides at a level higher on the side, like would be given in the mushroom or one-spatial dimension diagram in [1].

Actually it would not be pinched but level out a bit because inside a spherical mass there is more sideways pulling. And in a point sized black hole there would be a pinched center. And perhaps the loop shape described [2].



The measuring units are then exactly x position offsets of sample points and the vertical is the time dimension, 1-dimensional cross section of the area t^2, equal to $\sqrt{(t^2)} = t$. Rather, it is flipped, with x sideways and t upward.



With the flipped graph, there are two intersections but as we go along t toward the loop along the spacetime trajectory, time then goes backward toward a fixed point back. However, if we undo the scaling or minimum acceleration constant addition, the $\sqrt{(Y)}$ or t value actually goes to infinity.

[1] *Dark Matter Halo "Swiss Cheese", "White Tears", Dark Matter Properties and Space-Time Bubbles*. Denis Ivanov. The General Science Journal. Mar 24, 2017. <http://gsjournal.net/Science-Journals/Essays/View/6853>

[2] *Warp Navigation*. Denis Ivanov. The General Science Journal. November 8, 2015. <http://gsjournal.net/Science-Journals/Essays/View/6246>

[3] *Symmetric Contradiction in Relativity Theory, the Importance of Velocity Direction, and Feeling the Earth's Acceleration*. Denis Ivanov. The General Science Journal. February 27 2017. <http://gsjournal.net/Science-Journals/Essays/View/6814>