The Examination of time, the important overlooked correlations-effects
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Abstract: Here we analyse-examine the **time** progression in relation to inertial mass motion, the historic significant markers and current understanding.

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From the logic of the impulse-time-domain-momentum equation first examined by Rene Descartes, helped-refined by Huygens and enshrined in three **famous**-fundamental laws by **Newton**:

$$time=mdV/F_{orce,}$$

wherein the force is **assumed** having a steady-continuous-magnitude for the change in momentum mdV mass acceleration time duration-action. The logic in words: The **time duration** is greater for obtaining a greater momentum **mdV** magnitude and is shorter for a stronger Force! Important, this limitation is only attainable with amounts of spare potential energy escaping the momentum-time domain-realm, passing already right away into the displacement-distance-energy domain inertial mass motion analysis. This is, because, the vertical-kinematic gain in momentum **mdV** multiplied-factored by ½ the base line **time** duration is the prime important fundamental mass motion acceleration displacement **distance** correlation within this triangular-geometric-miniscule raise over run section construct: the **dV** in the vertical and **dt** run in the baseline:

$$S_{distance} =dV*dt/2;$$

Accordingly, the displacement distance **S** is **generally-fundamentally** the area under the change in momentum **mdV** curve line; then we can postulate already the important-fundamental energy-flow existence-**prerequisite**-requirement for **momentum** from within these most two basic kinematic formulas arrive at:

$$E_{energy}=mF_{force}S_{distace,displacemen}!$$

Together, these three monumental formulas: **momentum, distance and energy** are **together** very important kinematic correlations are hopelessly **underrepresented** in any Newtonian based physics-books! Newtonian physics-books emphasising the advantage that the impulse-momentum-time derivative

alone has a directional **vector** definition, while the time-duration has no geometric direction definition all-alone by **itself** whatsoever, because we proof here that it is **irrational** all alone by itself! All inertial mass motions constructs, in the time domain and the displacement-distance domain are needing always a guiding surfaces to **impose-restrain** an inertial mass motion geometric direction in form of rails, a gun tube inner surface, a bow and arrow displacement construct, an angular pivot point surface or the angular-magnetic directional concentration-axial-direction of an electric conductor loop! While the **distance**-displacement of an inertial **mass** has a **real rational** quality; because, we can observe the actual distance-displacement-direction, measure the distance-displacement with a simple ruler, feel small inertial mass displacement directional action quantities and in worst case, be injured by it, because speed kills! $E_{energy,work}=mdVV_{average}$,

having a dangerous V^2 quadratic escalating progression! These qualities are all observable with Galileo's famous inclined notched board! While the momentum motion quantity needs a clock timer relying **itself** on motion of mechanical particles or motion of electron-mass-particles to gage the motion reality-quantity of distance per time-intervals and the mechanical guidance reality!

The underlying function for the change of momentum for a given force is:

$$dV=F_{force}\, t_{time}/m_{mass}\, ;\ and$$

$$a_{acceleration}=F_{orce}/mass$$

 in words: the greater the force, the longer the time duration of the force and the smaller the mass the greater the velocity gain dV and the greater the acceleration! This, important correlation, **clarifies** Newton's **third** Law, allows the possibility of Inertial Propulsion because Energy is:

$$E_{energy-work}=ma_{acceleration}\, S_{displacement-length.}\, ;$$

and because the total energy sum of one **single** mass particle is:

$$E_{energy,\textbf{total}}=E_{energy,angular}+E_{energy,strait-line}$$

This correlations allows a **differential** acceleration, differential time intervals per angular motion distance and **differential energy** flow to exist for **differentially-separated mass** magnitudes and **differential** radius magnitudes within **repeating** cyclic angular motion distances projected onto straight line motion:

$$E_{kinetic,total} = 1/2mV^2 + 1/2w^2mr^2 \; ,$$

And expressed for a force exerting between mutual reciprocal mass **ratios**:

$$E_{kinetic,M} / E_{kinetic,m} = m/M \; ,$$

Expressed in words: **in words**: The two mutual reciprocal ratio of energy-magnitudes **have** an inverse relation to the reciprocal mass magnitude ratio, the smaller mass receives a **larger** portion of the total energy used-applied during the third law mutual reciprocal acceleration action; because the **smaller** mass receives the larger displacement **distance** and a larger **acceleration**-magnitude during the acceleration action! This correlation is also the important gun-projectile motion relation.

Wherein, the square multiplied by a square is a cube function, is the basis of angular Inertial **Propulsion** motions fully explained in the authors in-**depth** book: "Inertial Propulsion and you thought it's impossible" on Amazon.com books.

The Time duration is a fill-delay time, **filling** the inertial mass-reluctance **m** with momentum **mdV**; in words: the larger the mass, the smaller the force the longer is the fill delay time for the same velocity change **dV** acceleration action! This correlation is indicating the **irrational** nature of the equal repeating **monotone time** derivative concept! This view of time as a fill delay-variable time is inevitably applying within all physical mass constructs: in clocks, in all machines working with inertial mass motion elements; of which the filling of the gigantic Saturn-Rocket thrust chambers with energetic propellant-mass mixture, pressing-filling against the tremendous thrust pressure within, is the most energetic, gigantic, flawlessly repeating-successfully time filling action over a **critical**-restrained **time**-interval ever first build-accomplished by mankind! Because:

$$E_{energy,work} = mF_{Force}V_{Velocity}$$

This physical example is reaching into the realm of energy flow: The physical energy supply magnitude restraint-barrier over time duration, a **size** restraint function culminating in the $E=mc^2$ end barrier!

At the same most basic algebraic kinematic logic: the

$$time=distance_{displacement}/velocity_{average} :$$

wherein the instant $Velocity_{,average}=dV/2$

providing us with the time in the displacement-energy realm and proving the reality-proof of the before-**firstly** stated:

$$distance_{displacement,reality}=time*dV/2 ,$$

in the beginning of the paper, acceleration=Force/mass , and then:

$$\textbf{time}=(mass\ 2\ distance_{displacement}/Force)^{\textbf{1/2}},$$

a square **root** function-progression, we are also able to express time as a time squared function for a repeating distance-displacement sections:

$$\textbf{time}^2=mass\ 2\ distance_{displacement}/\textbf{Force} ;$$

accordingly, time is **<u>irrational</u>**, because, in the real rational distance displacement domain, the square root out of 2 is an endless fraction and **time** has, within the repeating distance sections, an irrational flattening **curved** function trending toward zero(0)! This indicates and proofs **that not both**, repetitive repeating distance-displacement and equal-repeating monotone time-intervals can not **exist together, they are mutually incompatible** within the same inertial mechanical mass motion analysis! Therefore, the time derivative is irrational! This proofs: variable energetic angular motion translated-projected onto constant repeating strait-line motion distance has a **real** energetic inertial mass motion capacity within a total aggregate **multi** mass construct. Accordingly, using time as an measurement stick together with mass must also be irrational!

We replace the acceleration in the standard algebraic-kinematic form to make it comparable-understandable in **all** general mechanics providing the first original root cause to overcome the inertial mass reluctance:

$$acceleration=Force/mass;$$

in words, the acceleration is greater with a larger force and smaller mass; because Newton's stated inertial mass reluctance force opposing any inertial mass motion is:

$$\text{Force}_{\text{oposing-the motion}}=\text{mass}*\text{acceleration};$$
$$\text{"in contrast"}$$
$$\text{Energy}_{\text{work}}=\text{Force}*\text{Distance}_{\text{displacement}},$$ this allows us to replace the accelerations within the algebraic-kinematic form to obtain with the <u>first primary real known root cause</u> of:

Energetic gravitational, energetic thermodynamic, energetic electrodynamic, energetic spring forces and living-energetic animal Forces; wherein "energetic" means a force over displacement distance; accordingly, this includes: all known natural forces having always **energy**-fuel-**volume** as the **first original root** cause! Wherein energy is assigned a real mass volume and the equivalence of a dashpot motion, consisting of a liquid motion stirring-friction action passing force*distance causing a measurable **rising-change** in liquid temperature-energy state by friction.
These principles were summarised in Heinrich **Hertz** monumental works,
"The mechanics in a new Form";
he was also the first inventor-builder of electro-dynamic radio communication and radar **detection** demonstration devices!

The principle of time in the momentum/energy form was, however, already **evident** from the very beginning with Galileo's famous notched board experiment, wherein equal spaced notch separating distances provided a progressive shorter time duration between each notch clicking sound action; wherein no limitation of the shortest time duration was not yet known, until the successful measurement of the speed of light; Special Relativity determining the speed of light having the shortest time interval between travel distances and assigning the famous energy limiting factor of

$$E=mc^2\,!$$

For providing equal repeating monotone time intervals clicking sound between each notch on Galileo's declining board for Newton's momentum-time domain equal-monotone repeating time interval derivatives, the notches have to be spaced with progressively larger separation distances in a 1,3,5,7,9,11 multiplier distance progression having an obvious dimensional limiting characteristic within the realm of a large isolated system of the solar system size! Here, the Time accordingly, is irrational in the momentum realm as well; but then, momentum itself must also be irrational! To fully understand the time derivative, we must use the

maximum known inertial mass speed limit c for electron particles, use an one second (1) velocity dV step gain from zero to c; accordingly also c number of derivative steps of 1 second duration and 1dV velocity gain filling the total c speed of light magnitude, arriving at Einstein's Galileo's formulation

$$E=mc^2 \text{ again!}$$

Then, Newton's claim, in his letter to Hooke: "I am seeing forever, for I am standing on shoulder of giants, appears exceeding his self-set scientific research limits, a form of unreasonable double talk: "I will not considers the angular motion reflectons onto strait line motions and it would be too tedious to examine all and **every** example", double self limiting his research range, expelling any chance of venturing into inertial propulsion constructs! This self limiting action indicates Newton's honest evaluation of his own work is not **realised** in science of today and perhaps shows Newton's sense of the hidden immense complexity of science by using the word "tedious". Standing on shoulders of giants appears instead stepping onto his preceding-contemporary successful hard working scientists-inventors work agenda: Descartes, Huygens, Leibniz, Bernoulli, LeHospital, etc.. etc.. ; they, for some preceding period of 20 years prior to Newton already working-produced papers and machines in both the energy vis-viva form and the momentum form side by side! While Newton kept his energy research un-published, until post-mortem-discovery, but he did acknowledge Huygens visit to the London royal society in the **preamble** of his first "Principia" **without stating** Huygens energy-principle publishing purpose- performance! While Newton's uncomplicated-majestic force-time-mass-momentum principle is not a reality reaching to infinity forever because of the inherent time/distance square-root, time-squared function. Today, we know that the most common form of outer space structure is the circular-angular form of the solar system and the circular-angular form of the galaxies having each mutually-reciprocally a reciprocal **balance** of Huygens centrifugal and Newton's centripetal energy preservation force having each identical formulation-logic ; these two forces can not be logical separated! It is hard to understand Newton's bypassing-shunning the force passing a distance-displacement energy-work concept, as surly as the farm animals on his native farm needed feed energy to perform work and ripe apples fell onto his head doing work, an action at a distance :

$$Force_{animal} * distance_{displacement} = work_{useful}$$

On the other hand, light has both uniform-**invariable** travel distance per time durations and a **steady-uniform** motion **direction** for one photon energy packet transitions in empty space; the photon is mass-less but retains its motion direction as if it has a mass inertia! Why not use the present author's **box** light-clock-design having a build in time-leap-detection-adjustment function, described on "GSjournals.net, author G. GUTSCHE" for time analysis-measurement and the light virtual inertia measurement-analysis?

In closing: Some scientist try to call the presented correlations "**Gutscherian** energy mechanics, a separate new science", without taking into account the enormous work performed by all scientists, from Galileo to Hertz to Le Grangian to Hamiltonian… on the viability and reality of Energy science!

Also, perhaps not directly related, if we examine a tiny sky-light-ray passing through the smallest pin hole possible using the expansion of best **microscope** available, we will find that, **in average,** all **light** sources from very near infinite distance galaxies are having-occupying an **average**-equally spaced separation distances! Therefore, Einstein general relativity also needs examining!