The inherent relation between motion and force (Motion creates the forces of nature)

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Abstract:
It is proposed that 'motion at speed 'c' is a fundamental property of matter' and that 'force is reaction to motion'. The consequent changes in the interpretations of motion, energy, force, field, interaction, integration and stability are explained, and a new force equation is proposed. This new concept removes all the singularities existing in the present theories.

Key words: Absolute motion, Forces of nature, Antigravity, Conservation of force, Force- energy equivalence, Force constants, Singularity, Balance of forces

1. Introduction:

Classical physics is built upon the Newtonian concepts of motion and force. However, Newton's approach was mathematical. He did not enquire into the physical possibilities whether straight-line motion is possible in a real situation of three-dimensional body and three-dimensional space, and also whether motion creates any repercussions in the body. It is this drawback that led to the later non-classical theories, 'Quantum Mechanics' and 'Relativity Theories of Einstein'. So, Newtonian physics requires modification; and this is an attempt to modify it of without destroying its classical nature. Naturally, the explanations based on the later theories are completely ignored in this paper.

2. Concept of absolute motion of matter:

A commonsense based reality requires that speed is finite – an infinite speed implies that a body can go away and comeback instantaneously. Stars, planets, electrons, etc. follow closed paths; so it is a possibility that only a closed path is possible in three-dimensional space[1]. Whether a body moves on its own or has to be forced into motion and whether motion is absolute or relative are issues that cannot be easily settled; the options have equal possibility that we can select any. Based on these, the following concept of absolute motion is proposed:

"The fundamental particles of matter move at the speed of light and follow closed paths in absolute space."

This implies that the natural energy of any body is $mc^2/2$ and bodies having no internal energy should be moving at speed 'c'. For e.g., how fast will our galaxy-cluster be moving? Earth moves nearly 30 times faster than moon; taking this as a rough estimate, our galaxy should be moving 25 to 30 times faster than sun, and the cluster, 25 to 30 times faster than that, or nearly at half the speed of light; so we are moving at that speed. This indicates the possibility that the natural energy of any body can be $mc^2/2$. However, the speed of the cluster accounts for only one-fourth of natural energy, and the rest should remain inside it. This requires that a significant part of energy remains inside the nucleus of atoms[2].

3. Energy and the Forces of nature:

The Newtonian concept views that motion is something imposed on a body. The entity that imposes the motion carries the reaction, and the body is left with action (motion) only. If, as proposed, motion is a property of the particle, then it has to carry both the action and the reaction. It is proposed that this reaction manifests as forces of nature. So energy and force can be defined as follows:

"Energy is motion, and force, reaction to motion."

This implies that energy can exist only as 'motion of matter' and that field does not carry energy. However, this requires that light is '*matter particles*' moving at speed 'c'[1]. Force cannot impart motion, but can cause changes: if the speed of the body increases due to an external force, there will be a corresponding decrease in its internal energy. Depending on the nature of motion, there can be three kinds of forces, and these are the only forces of nature:

> *"Translational motion creates gravity; vibratory motion creates electrostatic force, and translational motion of particles having vibratory motion creates magnetic force."*

Gravity is always attractive; energy acts as a pseudo repulsive force, and can be called '*antigravity*'. Electrostatic and magnetic forces are both attractive and repulsive. The so-called strong nuclear force can be identified as gravity at the level of electrons, and the weak nuclear force, as antigravity inside the nucleus. If this concept is correct, then it should be possible to unify the above three forces by theoretically deducing a common constant[3].

4. Conservation of force, and force constants:

Motion being finite, both energy and force are finite and equal to $mc^2/2$; we can use energy units to measure force. In the case of fundamental particles, the force is solely attractive. When these integrate, this force is transferred; no additional force is created. At the level of electrons/positrons, the force splits into gravity and electrostatic force[3]; gravity depends on the speed of electron, and the electrostatic force, on the vibratory motion inside it. Thereafter, gravity and electrostatic force act as independent forces, and are separately conserved; magnetic force is created at the expense of electrostatic force. During integration, energy and force are used up, and with each step, the available energy and force decreases. Though the energy used need not be equal to the force used, the unused force and energy, available for the next level, will again appear to be equal. This relative property can be called '*force-energy equivalence*'. Once the whole force is used up, the integration stops.

The force constant depends on motion (energy), and is such that it satisfies the force- energy equivalence at that level. So the force constant for unit speed is different for each level.

Electrostatic constant depends on the speed equivalent of the inside vibrations of electron. Magnetic constant depends on the electrostatic constant and speed of electron; but at present, the constant for unit speed is used, and the actual speed is included separately in the equation.

Gravity is similar to magnetic force, and the constant depends on speed; or G is proportional to the square of the speed. So, the absolute motion of a body can be verified by measuring its G; the G of a body remaining at rest will be zero. The value of G now used is actually the constant for the speed of Earth[4]; it is found that the measurement of G does not give consistent values indicating that it may be varying with the speed of Earth.

5. **The new equation for force:**

Since energy acts as antigravity, the equation for calculating the force between two moving bodies should include the speed factor also. Attractive force tries to bring the two bodies together in the resultant direction, whereas the velocity components perpendicular to that act against the force. These components will be equal, and so can be represented in terms of one body. In the case of gravity, the constants would be different for the two bodies, as G depends on speed. So, the following equation is proposed to calculate gravitational force:

$$F = \frac{\sqrt{G_1 G_2}\, M_1 M_2}{d} - 2 \times \frac{M_1 v^2}{2}$$

Here, the force obtained is in energy units, and $M_1 v^2/2$ represents the antigravity component of each. When the two bodies remain at relative rest in a common field, the above equation gets reduced to Newton's equation. In the case of an orbiting system, the G of the system is to be used for calculating the force. Here, the parent body is at relative rest, and the speed of the orbiting body acts against the force. So the equation becomes as follows:

$$F = \frac{GMm}{d} - \frac{mv^2}{2}$$

However, the existing relation $GMm/d = mv^2$ is still valid; only the force calculated is different. So the actual force in the case of an orbiting body is $mv^2/2$ and not mv^2. The equations for other forces should be corrected in the same manner.

6. **Field, interaction and singularity:**

Field indicates that force is available. For interaction, the bodies require the respective fields. A body has to contribute half the force required for each interaction. In the case of electrostatic and magnetic forces, the interaction can be both attractive and repulsive; the available force can be used in any ratio for the two interactions. When the force is completely used, the body will not have any fields. So an independent system has no external fields; at any instant, the whole force remains fully used inside it. This implies that distance between bodies cannot be arbitrary. The universe is an independent system, and so the distance between the bodies should be predictable [5].

As force is finite, field will also be finite. It can be seen that for a certain value of *d*, the terms on the right hand side of the proposed equation become equal, and the force becomes zero.

Beyond that distance, there is no force, or field has no effect. Thus the new equation implies a '*finite field'*, whereas, Newton's equation implies an infinite field.

The new concept thus removes the '*singularities*': motion, energy, force and field of a finite amount of matter are finite. So volume can neither be zero nor infinite. The only infinites left are the infinities of time and space, and these infinities do not affect matter.

7. Balance of forces and stability:

Attractive forces try to integrate matter, and the repulsive forces, including antigravity, try to disintegrate matter; a balance between these two results in the stability of a system. In heavier particles, the constituents are closely packed. The gravitational force due to motion keeps the constituents together, and the antigravity inside it opposes this. However, this is not a stable structure; a minimum of three independent forces are required for stability. In atoms, electrons are held by gravitational and electromagnetic attraction; antigravity of electrons (which includes the spinning and translational motions) oppose this. A balance between these three independent forces makes the atom spatially static, and thereby stable.

A mass (a mass of atoms) also contains three independent forces that remain balanced, and so are spatially static and stable. An 'orbiting system of masses' attains a state of equilibrium due to the balance between attractive and repulsive forces. However, it has only two forces, gravity and antigravity. So, the system is spatially non-static, and the mean distance between the 'masses' remains changing with time, though at every instant, the forces remain balanced. The universe is a system made up of orbiting systems. As there are only two forces, the distance between the orbiting systems changes with time. Here also, the attractive and repulsive forces remain balanced, and at any instant, the system is in equilibrium. The basic units of the universe, the 'masses' made up of atoms, are stable, and so the universe always exists as a 'complex system of masses' and remains in a state of dynamic equilibrium.

8. Conclusion:

Physical definitions for motion and force are proposed in this paper. This new concept removes all singularities, a major problem arising out of the present theories. So this may be a better theory than the existing ones. However, as mentioned in the paper, further explanations are required for theoretical consistency. [1] [2] [3] [4] [5]

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[1]. A paper proposing that '*light contains matter particles, and follows a circular path*' will be posted subsequently in **viXra**.

[2]. A paper suggesting that in electrons, protons and neutrons '*half the natural energy remains inside as vibrations'*, will be posted subsequently in **viXra**.

[3]. A paper suggesting '*how force splits into gravity and electromagnetic force at the level of electrons and how a common constant can be used'* will be posted subsequently in **viXra**.

[4]. A paper proposing a '*theoretical deduction of G'* will be posted subsequently in **viXra**.

[5]. A paper proposing a '*theoretical deduction of Earth- moon distance'* will be posted subsequently in **viXra**.