

Quark Oscillation Causes Gravity

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Abstract

Quark movement is almost by the speed of light. Due to this speed their inertial mass-effect increases profoundly. That inertial effect is an accelerating force. Within the nucleon the force is the strong force. As quarks movements are back and forth movements, called zigzag or oscillating movements, there is movement in opposite directions. So the oppositely acting forces annihilate each other. However the force acting on objects receding from each other is a trifle stronger than that acting on objects approaching each other. This small difference between these forces is a “left over” force and “leaks” out of the nucleon. In previous manuscripts, formulae were presented to calculate these forces. In the present paper the “left over”, “leaking” force is estimated, and this force is gravity.

Keywords

Quarks Cause Gravity, Strong Force Leakage Is Gravity, Unification of Relativistic Physics with Quantum Mechanics, Gravity Explained

1. Introduction

According to Newton, gravity is proportional to mass, and Einstein claimed that gravity is expressed through the curvature of space time. Although these are important features of gravity, neither addresses the cause of gravity [1]. Therefore further elucidations are desirable.

In general relativity it is accepted that gravity is the same as any other acceleration, and as said, gravity is also proportional to a body’s mass. That implies that the inertia of a body, together with its mass, causes its gravitational effect. In other words, the mass of a body and its energy are its inertial mass [2]. Therefore, what causes gravity of any body is its inertial mass.

As the mass of a body is made up of atoms, which are made up mainly by quarks, the inertial mass-effect of an object at rest is related predominantly to the quarks. So the mass-effect of an object at rest is dependent on its quarks inertial mass. This inertia is a result of the velocity of movement of the quarks oscillation within the proton or neutron. Therefore, quark oscillation causes gravity [1] which is analogous to electron oscillation causing

electromagnetic radiation. Electromagnetic radiation is made when an atom absorbs energy. The absorbed energy causes electrons to change their locale within the atom. When the electron returns to the original position, an electromagnetic wave is produced. Similarly, the back and forth movement of the oscillating quarks within the atom, which is related to the potential energy of matter, ensues in the production of gravitation. The potential energy of matter converts into other forms of energy, that of electrons into electromagnetic energy and that of quarks, into gravitational force.

The velocity of quarks within the nucleon is near the speed of light. According to a previous publication [3], with the increase of the velocity of a particle, its gravitational effect increases, due to an increase of the object's inertia and thereby an increase in the gravitational effect, and so also—of the gravitational constant.

In that previous manuscript it was shown that the stronger force required to accelerate a faster moving object is due to an increase of the object's inertia, not its relativistic mass. As inertia and gravity are actually the same [4], with increase of velocity, thereby increase in inertia, also the gravitational effect of an object increases. As

$g = -\frac{GM}{r^2}$ with the increase of the gravitational effect of an object, also the gravitational constant G increases, so with increase of an object's velocity, “ g ” increases and thereby also “ G ” increases. To calculate the increase of “ G ” with velocity, formulae were developed [3] [5]:

$$G_{rel} = \frac{G}{\sqrt{1 - \frac{v^2}{c^2}}} + \frac{G \frac{v^2}{c^2}}{1 - \frac{v^2}{c^2}}$$

This equation applies to objects moving apart from each other.

$$G_{rel} = \frac{G}{\sqrt{1 - \frac{v^2}{c^2}}} - \frac{G \frac{v^2}{c^2}}{1 - \frac{v^2}{c^2}}$$

This equation applies to objects approaching each other.

2. Effect of Quark Motion

Gravity acts between quarks [6] just like between any particles and quarks back and forth movement is almost at the speed of light [7]. Therefore the gravitational effect between them is much stronger than between slow moving or stationary objects. Gravity is the result of the back and forth movement of the quarks within the nucleon, so it is a sequence of the strong nuclear force. This back and forth quark movement is also referred to as quark vibration [8] [9] or oscillation [10].

That explains why the gravitational force between quarks is 10^{38} stronger than between objects outside of the proton and neutron. This is the strong nuclear force. For that reason there is no real requirement for the existence of gravitons [1]. The strong force acting between quarks within the nucleons, provides the link between matter and gravity. Quark zig-zag within the nucleon [11] is a back and forth motion. That means that they also move in opposite directions. Quarks approach each other as well as moving apart from each other. So it can be concluded that the strong force also acts in opposing directions. Forces that act in opposite directions obviously annihilate each other. They even might extinguish or abolish each other altogether. As described in the previous publications [3] [5], what holds true for gravitation also applies to the strong force. That means that there is a small difference between the force acting on receding objects to that of approaching objects.

For objects moving at the speed of light, whatever their direction, the force is infinite and therefore extinguish each other. However, objects moving a fraction slower than the speed of light, a small difference between these forces exists. The force acting on receding objects is a trifle stronger than that acting on approaching objects. This difference can be calculated by the mentioned formulae. This small difference between the two forces, acting in opposite directions, is not completely annihilated. So there remains a small, almost redundant “left over” force. This “left over” fraction of the strong force leaks out of the nucleon. Some of it is the proton neutron binding force but it is also gravity.

the biggest mysteries of physics and the biggest obstacle to a universal theory that describes the functions of every interaction in the universe [20]. Gravity, as elucidated by the herewith presented mechanism, solves the unification problems in physics. The two mainstream theories of physics, the general relativity (GR) and the quantum field theory (QFT), as they are currently formulated, are mutually incompatible—they cannot both be right [21]. It is the acceleration of energy of the quarks within a particle and the particle’s motion that produces inertia, and consequently—gravity. This mechanism of gravity suits any hypothesis, so solves the unification problem.

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