The relativity theory and its fundamental elements

A paper by: Dipl. Ing. Matthias Krause, (CID) Cosmological Independent Department, Germany, 2009

Objective

This essay explains how the relativity theory influences the physical measures of space, time, mass, and even the life of people.

Outline

1. The speed of light as constant measure
2. Areas of different speeds
3. The relativity factor – γ factor
4. Impact on physical sciences and life
5. Thoughts about the fundamental consequences of the relativity theory

The speed of light as constant measure

Until the beginning of the last century, space, mass, and time were defined as absolute, unchangeable measures. Albert Einstein, however, could prove that the speed of light is the sole physical measure to be absolute and therefore, constant (in a vacuum). All other measures, such as time, mass, and space, depend on the speed of light. According to Einstein's relativity theory, formerly absolute measures are now variables.

The theory of the speed of light as absolute measure and the other measures as variables leads to the following: The moving speed of a mass changes space, time, and length. The speed of any mass is observed in relation to the speed of light. Each mass that moves with a certain speed compared to another mass is in its own space-time-continuum.

Areas of different speeds

A small example shall demonstrate the impact of the relativity theory on our personal lives: A person is standing close to the interstate and watches the moving cars, which pass at a speed of 200km/h. The standing person is trying to focus on the driver's faces, but fails to do so as the cars are moving too fast. One of the cars slows down and proceeds to a parking lot. It slows down until it comes to a standstill. The driver exits the car and just then, the person realizes that the driver is his coworker. They start to talk. Suddenly, a car crashes into a bridge at 200km/h. The driver dies instantly; the car is totaled.

This story illustrates that the onlooker and drivers are in areas of different speeds.

The relativity factor – γ factor

To fully grasp the impact of the relativity theory on life with the help of the example, it is necessary to highlight the relevant facts:

1. Two areas of speed are present in this example (the standing onlooker, and the moving cars)
2. The boundary between the two spaces cannot be crossed without (deadly) consequences.
3. In order to move to a different area of speed, additional energy is necessary (acceleration or slowing down).
4. Direct contact between people in different areas is only possible when both move at the same speed in the same direction.

These facts are common knowledge; however, they are the fundamentals in understanding the relativity theory. Before the physical connections can be evaluated, the formula for the relativity is to be examined:

$$\gamma = \frac{1}{\sqrt{1 - \left(\frac{v}{c}\right)^2}}$$

Where γ is the relativity factor, v the speed of a moving object, and c the speed of light at 300,000km/s.

The gamma factor determines how much time, space, mass, and the length of mass change in relation to a stationary object. If the formula is solved for v, it is possible to calculate the speed needed to reach a specific value for γ.

$$v = \sqrt{1 - \frac{1}{\gamma^2}} \times c$$

γ changes according to the speed, but the speed of an object can only come close to the speed of light. It can never move at the speed of light. *Figure 1* shows that γ barely changes at minimal speeds. Nevertheless, γ increases considerably at high speeds. If a mass was to reach 100% of the speed of light, γ would grow infinitely.

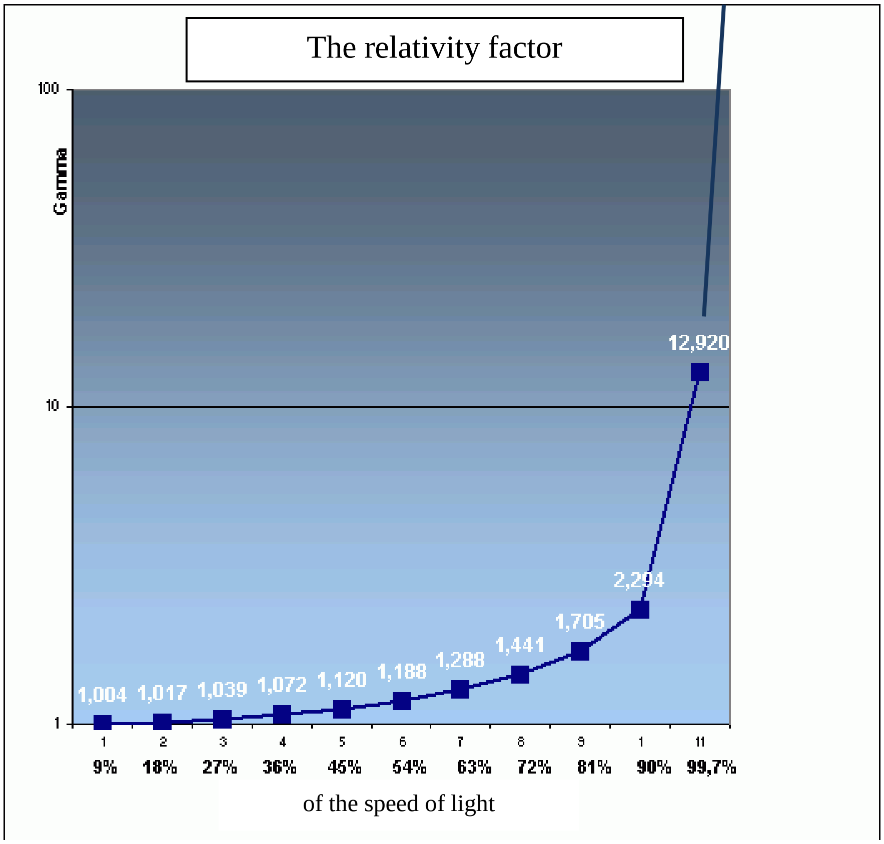

Figure 1

The graph with logarithmic scaling of the y-axis shows that γ does not change dramatically. Even at a speed of 27,000km/s, this equals about 9% of the speed of light, γ only increases by 0.4%. However, γ increases rapidly, with speeds close to the speed of light.

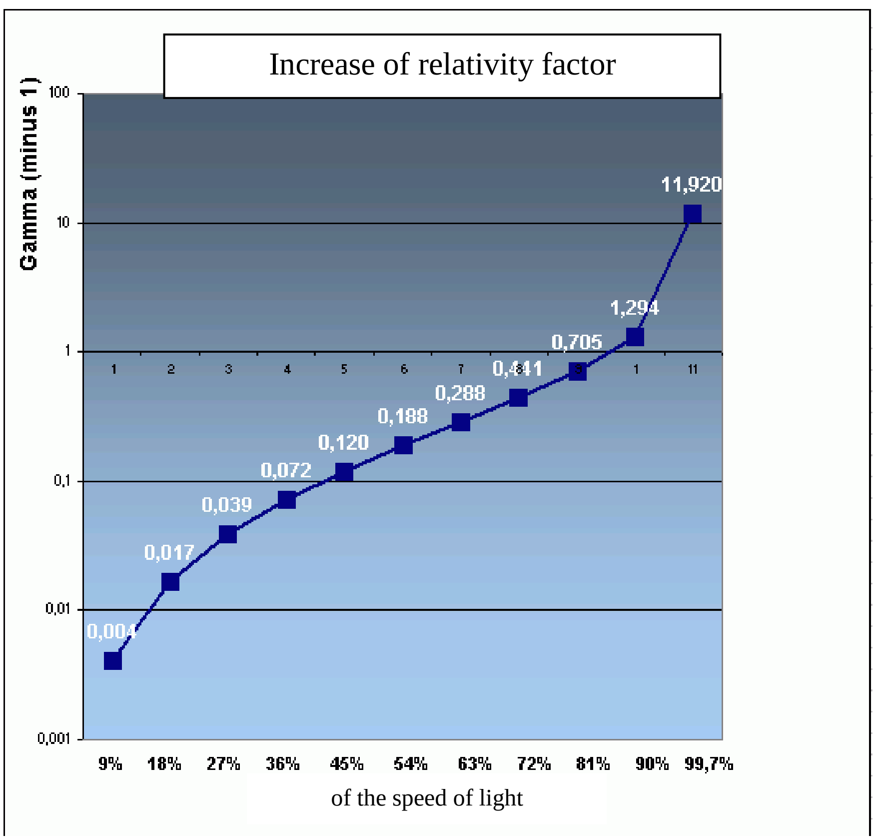

Figure 2

If one is subtracted from the gamma factor, only its increase is left. At 50% of the speed of light γ increases by approximately 15%. This specific ratio between percentages and a factor is found in every galaxy of the universe. The increase in γ is equal to the increase in mass from edge to center in any given galaxy. In addition, only this clearly defined increase in mass ensures that all masses in a galaxy move at a constant speed.

Impact on physical sciences and life

A moving object (mass) compared to a stationary mass displays the following changes. In the example, a car moves passed the standing person at 200km/h.
Determining of γ:

$$\gamma = \frac{1}{\sqrt{1-\left(\frac{55.5555}{300,000,000}\right)^2}} = 1.000,000,000,000,02$$

The speed of the moving car is 200km/h, which equals 55.5555m/s.
The speed of light is 300,000km/s or 300,000,000m/s.

The γ factor is practically 1. Hence, no measurable or observable difference is apparent.

Time has stretched relative to the standing person:

$$T_{rel} = \frac{T}{1.000,000,000,000,02} = 0.999,999,999,999,983$$

While one whole second passes for the stationary person, almost a second passes for the person in the car. Depending on the speed, different time windows open.

The **space** of the moving car, relative to the onlooker, has shrunken by γ.

The **mass** of the moving vehicle, relative to the onlooker, has increased by γ.

The **length** of the moving car, relative to the onlooker, has decreased by γ.

These are the changes in time, space, mass, and length if the world is described with the relativity theory. (the differences have been measured for faster moving objects and match the above calculations)

Thoughts about the fundamental consequences of the relativity theory

The speed of light dominates time, space, mass, and length of a fast moving object. This can be observes from Earth, for example:

1. The decomposition of myons in the atmosphere (also see examinations of the local time window)
2. Far away galaxies with a high red shift or a high flight speed are pulled toward the edge of the universe and almost reach the speed of light. For these galaxies γ equals 1000 or even 2000.

Time, relative to a stationary observer on Earth, passes slower on these galaxies. While one year passes on Earth, only about 8min pass on such a far away galaxy
Space, relative to a stationary observer on Earth, decreases by γ.

The **mass** of the galaxy, relative to a stationary observer on Earth, increases by γ. This is the so-called relativistic mass increase (the true reason for the so-called *dark energy*)
The **length** of the galaxy, relative to a stationary observer on Earth, shortens by γ.

The formation of a galaxy at the edge of the universe must happen 1000 times faster, as less time is available. This is physically impossible, and a devastating blow to the big bang theory.

3. If a human being could move at the speed of light, the following changes, relative to a stationary observer on Earth, would be observable:

    - **Time** would stand still for the travelling person; he or she would not age anymore.
    - **Space** would be nonexistent.
    - **Mass** would increase infinitely.
    - He or she would go completely flat (invisible for the observer on Earth).

Thoughts

God lives in an unapproachable light. If this is true, time is nonexistent with God (eternity), space is nonexistent, and he would be invisible. These relativistic facts can be found in the bible.