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# The Irreversibility of the Arrow of Time in Space

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**ABSTRACT**

In accordance with the law of conservation of momentum, it is shown that the photon at when propagated in outer space, it loses its energy to radiation gravitational waves. With the complete loss of its energy, the photon disappears into the cosmic space. The loss of electromagnetic energy per linear meter is shown.

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## Introduction

In the special theory of relativity, it is assumed that a photon does not lose its energy when it propagates in outer space. On the basis of this assumption, the theory of the expansion of outer space was constructed. Propagating in outer space, the photon interacts with the matter of the physical vacuum (transmits to it a part of its momentum). The particles of the physical vacuum begin to make damped oscillations near the center of their equilibrium along the path of the photon. During these is how electromagnetic energy is converted into gravitational energy. At the end of its trajectory, the photon disappears from outer space.

## The Basic Part

Experimentally, the deflection of the rays towards the Sun was detected. The photon received an impulse directed to the center of the Sun. From the law of conservation of momentum. The sun received the same impulse in the direction of the photon's trajectory. The sun received the same impulse in the direction of the photon's trajectory. It has a strong effect on the Sun. Consider the mechanism of photon emission of gravitational waves. During the propagation of the photon in the physical vacuum. It should be assumed that the photon interacts with the matter of the physical vacuum. Assume that the photon shifts the particles of the physical vacuum from the equilibrium position along the path of the photon (Fig. 1). Particles of the physical vacuum begin to make damped oscillatory movements along the photon trajectory. When a photon interacts with a physical vacuum substance. Part of the photon pulse is transmitted to the particles of the physical vacuum. When the particles of the physical vacuum vibrate. Gravitational waves are emitted in a perpendicular direction to the photon trajectory (Fig. 1). The photon loses its energy until it completely disappears. To prove that gravitational energy is radiated from the photon's trajectory. In the form of high-frequency gravitational waves. You can set up an experiment (Fig. 2). For rice.2 shows a cylindrical glass flask installed so that the line A B is directed vertically upwards. Volume V is filled with water in which the smallest particles of an opaque substance are suspended. Through channel A B that is not filled with water. A powerful light beam is emitted from a laser radiation source. After some time, the particles of the opaque substance will gather along the AB channel. This means that the photon has the property of attracting matter to its trajectory. A photon can be taken as an oscillating system (clock). With a changing oscillation period. The period of oscillation of these watches is increasing. Until the source of vibrations (hours) completely disappears.

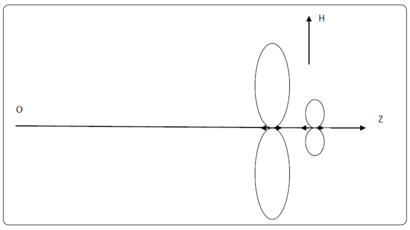


**Figure 1:** Shows the notation: OZ – photon trajectory; H-direction of propagation of gravitational waves.

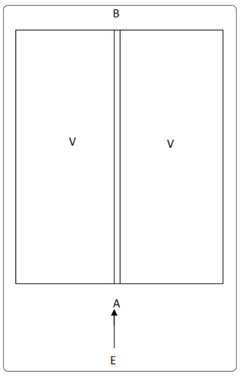


**Figure 2**

Hence the conclusion that the arrow of time on the scale of Space is always directed only in one direction. And it can't have a reverse direction. For Fig.1. shows a diagram (plots) of the propagation of gravitational energy from the photon trajectory.

Calculate the average energy emitted by a photon from the linear meter of the photon trajectory for green ($\lambda = 555$nm). The average energy emitted by a photon from a linear meter is determined from the formula $\varepsilon = h\nu/10^{25}$ D j= $3.6/10^{44}$ D j. Where $10^{25}$ is the horizon of visibility of the Universe. For Fig.1. shows the notation: OZ – photon trajectory; H-direction of propagation of gravitational waves.

**The Conclusions**

“The” reddening" of a photon as it propagates through outer space casts doubt on the Big Bang theory.