

Energy and time are equivalent

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time.

Key Words: Energy; Time; Planck time; Planck quantum of action

ABSTRACT

A formula is developed that shows the equivalence of energy and

INTRODUCTION

The equivalence of energy and time is not a well-established principle in physics. In physics, several established principles and theories describe the relationship between energy and time, but they are distinct concepts with different properties.

Energy is a fundamental concept in physics that refers to the ability of a system to do work. It comes in various forms, such as kinetic, potential, thermal, and electromagnetic energy. Energy is conserved in isolated systems, meaning that it can neither be created nor destroyed, but only transformed from one form to another [1,2].

On the other hand, time is a fundamental dimension in which events occur and are measured. It is a parameter that allows us to order and compare events, determine the duration between them, and establish cause-and-effect relationships. Time is a one-way dimension that flows in a forward direction, often referred to as the "arrow of time."

Derivation of a formula that describes the equivalence of energy and time

The formula for the calculation of dark energy was developed under the title „Calculation of Dark Energy and Dark Matter“. It is:

$$E_d = ht_u / t_p^2$$

This formula is now expanded below to

$$E = (h / t_p^2) \cdot t$$

Starting from

$$E = h / t$$

is obtained by substituting t_p for t

$$E_p = h / t_p$$

for the energy in the PLANCK time

For the energy per second, we get:

$$E_1 = h / t_p^2$$

and for energy in time t

$$E = (h / t_p^2) \cdot t$$

This is the general formula for the equivalence of energy and time.

If you use the age of the universe for the time t , you get the amount of dark energy.

Definition of the symbols used in the formulae

E = energy

E_d = dark energy

t = time

t_u = age of the universe

t_p = PLANCK time

h = PLANCK quantum action

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