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Essay on Calculating Dark Energy and Dark Matter

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Abstract

A formula for calculating dark energy is established through derivation. The result is tested on the basis of the available data from the MAX P_{LANCK} Institute for Radio Astronomy. The universe's dark matter has been computed. There is a balance sheet created and the most important formulas compiled.

Summary: The rudiments of a theory of dark energy. The theoretical result is confronted with the numerical value calculated from the available data. Excellent matching of numerical values resulting in three independent paths makes the approach plausible. The approach is credible because of the excellent matching of numerical values that produces three separate routes. The task at hand is comparable to Kepler's planetary orbital rules. Only Isaac Newton gave Kepler's laws a theoretical foundation, which Thomass Gornitz provides here. Niels Bohr, who computed the energy levels of the hydrogen atom and the frequencies of spectral lines, theoretically supported the empirical Balmer formula for the spectral line frequencies in the arc spectrum of the hydrogen atom. A mysterious element known as dark energy is theorized to accelerate the universe's expansion by repelling matter. Theorists have proposed a variety of methods to calculate dark energy over the years. Numerous theories, however, fail to apply a metric structure to gravity or energy momentum conservation even when they satisfy strict local tests. The most popular option for dark energy is the cosmological constant, often known as vacuum energy density. By its very nature, dark energy is a low-energy phenomenon that is dispersed. It is not present in galaxies or galaxies in clusters and it is probably unlikely to be found in laboratory research. The repellent dark energy that hastens the universe's expansion could be explained if the cosmological constant is the vacuum energy of space. Nobody, however, is aware of the cosmological constant's existence or the amount that might be assigned to it in order to calculate the universe's acceleration. Any two matter fields can interact with each other in particle physics or on a more theoretical level, according to a possible process called the interaction of dark matter and dark energy. The phenomenological theory in question has aroused the interest of the cosmology community for a number of reasons. As in the interaction model, where dark energy decays into dark matter, interacting models of DM and DE are an equivalent description of the dark sector of the universe that have undergone extensive research and are motivated by a viable explanation to the so-called coincidence and cosmological constant concerns.

Keywords: ***Dark energy; Dark matter; Calculation;*** **P_{LANCK}** ***time; Age of the universe; Cosmic information***

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Introduction

Dark energy is a mysterious energy. Nobody knows what dark energy actually is. Dark energy and dark matter cannot be observed directly. It is thought to be responsible for the accelerated expansion of the universe. Dark energy is, by this nature, a low-energy phenomenon that is dispersed. It is not found in galaxies or galaxy clusters and is unlikely to be found in laboratory studies. The repulsive dark energy that accelerated the expansion of the universe could be explained if the cosmological constant is the vacuum energy of space. Some considerations have been made; however, they have not yet produced fruitful results to date. In particular, it was not possible to carry out an exact calculation of dark energy. With the present formula, this goal has probably been achieved [1-6].

Description

Derivation of a formula for calculating dark energy

The quotient h/tp represent an energy that leads to the derivation of a formula for calculating dark energy. This requires only the assumptions that the P_{LANCK} time tp is an oscillation period τ and dark energy satisfies the P_{LANCK}/EINSTEIN formula:

$$E=h\nu \quad (1)$$

Qscillations are fundamental oscillations of the cosmic space. Thomas Gornitz says: "Structural quanta emerge from a quantum-theoretical description of "oscillation states" of a system around its ground state. They produce many effects. The AQIs of protyposis are also structural quanta and not particles. One can interpret them as the fundamental oscillations of the cosmic space" [7-14].

For dark energy E_d this then leads to:

${}_pE_d=h/t_p=1.229 \times 10^{10}$ J in P_{LANCK} time

${}_1E_d=2.28 \times 10^{53}$ J in 1 s

$E_d=0.994 \times 10^{71}$ J in 13.8 billion years for the age of the universe $t_u=4.358 \times 10^{17}$ s

The following formula for calculating dark energy in the universe is then derived from these calculation steps:

$$E_d=ht_u/t_p^2 \quad (2)$$

This simple three-sentence operation was supports by Thomas Gornitz in a more in depht manner, resulting in very well-matched numerical values. A connection to the empirical is thus achieved. Data shows us the nature of things as well as theories [12-14].

Formula (2) can be extended to formulate the general equivalence of energy and time:

$$E=(h/t_p^2) \times t \quad (3)$$

Definition of symbols used in formulas

E=Energy

t_u=Age of the universe

t_p=P_{LANCK} time

ν=Frequency

h=P_{LANCK} quantum of action

Conclusion

P_{LANCK} time can be understood as oscillation period. Oscillations are fundamental oscillations of the cosmic space; dark energy satisfies the P_{LANCK}/Einstein formula. Dark energy can be interpreted as information flow. The cosmic information multiplied by ln2 is nothing more than the age of the universe in P_{LANCK} time units squared. The surface of a spherical universe would still have room for the roughly sixefold portion of the cosmos's entire known information content. Dark matter corresponds to the number of protyposis (AQIs) in the cosmos. The informational equivalents of dark matter and the total mass energy of the cosmos are in a ratio 1/4. Dark energy and dark matter are in a ratio $2/ln^2$. The ratio of dark energy to the total mass energy of the cosmos is ln^2. Half of the hypothetical particles of dark matter are distributed over the black holes in the universe and can be made accessible after the experimental production of small black holes in a particle accelerator.

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