The Criterion for the Non-Utilizability of Cosmic Dark Energy: A Unified Framework Based on Field Composite Theory

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Abstract:  
Based on Professor Li Zhijun’s ABC theory, this paper proposes a fundamental criterion for determining whether a form of energy can be utilized. The core argument is: the utilizability of an energy form depends on its ability to form stable or meta-stable “field composites” and to participate in energy conversion processes driven by the reconstruction of field combinations. All identifiable and utilizable entities in the universe—from the 61 elementary particles to atoms, molecules, and even macroscopic objects—are field composites formed by specific coupling patterns of the electromagnetic vortex field the color charge vortex field and the Higgs vortex field The interactions between these composites (such as decay, fission, fusion) are essentially the disintegration of old field combinations and the reconstruction of new ones. However, dark energy, as a vacuum energy uniformly permeating all spacetime, is characterized by its failure to be coupled by any cosmic vortex field to form specific field composites. It more likes a pure form of “spacetime background energy,” lacking localized excited states (quanta), and thus cannot participate in any form of field recombination process. This fundamentally determines its non-utilizable nature. This criterion provides a unified explanation for the basic principles from microscopic particle physics to macroscopic energy technologies.

Keywords: ABC theory; Field composites; Energy utilizability; Dark energy; Particle physics; Cosmological constant

Elucidation of the Core Logical Chain

1. The Fundamental Building Blocks of the Universe are Fields, Not Particles

The fundamental reality of the universe consists of three vortex fields: the electromagnetic field the color charge field and the Higgs field Particles are merely specific, stable excitation modes or combination modes of these fields.

1. Particles are Field Composites

All 61 elementary particles (such as electrons, quarks, photons, gluons) can be described as field combination states formed by specific couplings of the and fields.

* Electron: (coupled to the negative charge branch of the field, singlet state of the field, vacuum)
* Up quark: (coupled to the 2/3 charge branch of the field, red branch of the field, vacuum)
* Photon: (excitation of the field, singlet state of the field, zero coupling to the field)

1. The Essence of Energy Utilization is the Reconstruction of Field Composites

Any process of energy utilization, from nuclear reactions to chemical reactions, to combustion and batteries, ultimately boils down to the transformation of field composites.

* Nuclear fusion: The composites of deuterium nucleus and tritium nucleus reconstruct into a helium nucleus and a neutron under high temperature and pressure. The released energy is reflected in the binding energy difference of the new composites.
* Combustion: The composite of hydrocarbon molecules and oxygen molecules reconstructs into carbon dioxide and water molecules releasing chemical energy.

1. The Fundamental Problem of Dark Energy: Lack of Field Composite Form

Dark energy is the cosmological constant described as the energy density of the vacuum. The key points are:

* It does not couple with any of the fields to form localized excitations. It is not any combination of the form
* It has no corresponding “dark energy quanta,” no field particles, and no localized, identifiable excited states. It is an intrinsic property of spacetime itself, uniform and indivisible.
* Therefore, no physical process can lead to the construction or reconstruction of a “dark energy field composite.” We cannot design a reaction where dark energy participates as a reactant or product because it is fundamentally not a “body” that can “participate” in reactions.

Conclusion

The existence of field composites is a prerequisite for utilizability. Dark energy is excluded from our energy utilization paradigm precisely because of its pre-physical, non-composite nature. It shapes the fate of the universe, but itself cannot become the fuel for any process within the universe. This criterion profoundly reveals the essential distinction between matter, energy, and spacetime geometry.

This summary elevates the ABC theory to a height where it can unify the understanding of particle physics, cosmology, and energy science, providing a novel theoretical framework for exploring the nature of cosmic energy.

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