

Wavelength Stretching of Light in Absolute Space: A Reduction of Relativistic Boundaries

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Abstract

Relativity denies the existence of absolute space, leading to its theoretical boundary. This paper holds that only “being” and “void gaps” exist in nature, and absolute void is the sum of void gaps. Time and space are manifestations of absolute void rather than itself. Based on the sole postulate that light propagates at a constant speed in absolute space, the core dynamic equation

$$\frac{d\lambda}{dt} = \frac{g \cos \theta}{c} \lambda$$

is derived from light pressure experiments. Furthermore, the redshift formula

$$1 + z = \exp \left(\frac{\bar{g} D_{\text{true}}}{c^2} \right)$$

and true distance formula

$$D_{\text{true}} = \frac{c^2}{\bar{g}} \ln(1 + z)$$

are obtained. This theory reduces relativistic time dilation and spatial expansion to real physical processes, serving as a supplement to relativity.

Résumé

La relativité nie l'existence de l'espace absolu, ce qui conduit à sa limite théorique. Cet article soutient que seuls l'être et les intervalles vides existent dans la nature, et le vide absolu est la somme des intervalles vides. Le temps et l'espace sont des manifestations du vide absolu plutôt que lui-même. En se basant sur le seul postulat que la lumière se propage à vitesse constante dans l'espace absolu, l'équation dynamique fondamentale

$$\frac{d\lambda}{dt} = \frac{g \cos \theta}{c} \lambda$$

est dérivée d'expériences de pression lumineuse. De plus, la formule du décalage vers le rouge

$$1 + z = \exp \left(\frac{\bar{g} D_{\text{true}}}{c^2} \right)$$

et la formule de distance réelle

$$D_{\text{true}} = \frac{c^2}{\bar{g}} \ln(1 + z)$$

sont obtenues. Cette théorie réduit la dilatation temporelle et l'expansion spatiale relativistes à des processus physiques réels, servant de complément à la relativité.

1 INTRODUCTION

The viewpoints in this paper on absolute space, wavelength stretching and non-expanding universe align with the research directions of domestic scholars:

1. Academician Li Tipei has long maintained a prudent attitude toward the standard cosmological model. His critical analysis of dark matter, dark energy and inflation hypotheses is intrinsically consistent with the judgment that relativity has theoretical boundaries due to the denial of absolute space.

2. Professor Chen Shouyuan proposed the light wave frequency attenuation mechanism, negating spatial expansion and the Big Bang cosmology, which is highly consistent with the physical logic of wavelength dynamics and true distance formula in this paper, providing important support for this research.

On this basis, this paper further derives the core dynamic equation from light pressure experiments and completes the systematic construction of Absolute Theory.

2 FUNDAMENTAL BOUNDARY BETWEEN PHYSICAL AND NON-PHYSICAL EXISTENCE

There are only two real entities in nature: “being” and “void gaps”. “Being” refers to concrete existences such as matter and light; “void gaps” represent the intervals between beings.

Humans conceive an independent “empty space” as a universal container based on the relation between beings and void gaps, but such empty space does not exist essentially, and its essence is absolute void.

Time and space are manifestations of absolute void, but absolute void itself is neither time nor space. Absolute void is non-expanding, non-contracting, motionless, free of physical properties and cannot be directly measured, which is the essential demarcation between physical and non-physical categories.

3 THEORETICAL BOUNDARY OF RELATIVITY

Relativity is an extremely precise and great physical theory. Nevertheless, since it does not recognize the existence of absolute space, inherent theoretical boundaries exist. Beyond these boundaries, additional ad hoc assumptions such as dark matter, dark energy and cosmic inflation have to be introduced to fit observational data.

4 DISTINCTION BETWEEN VOID AND MATTER

Void has no physical properties at all, and anything with physical attributes belongs to matter. Relativity attributes physical phenomena such as time dilation and spatial expansion to the inherent nature of void, which lacks solid physical basis. This paper restores these phenomena to measurable and real physical processes.

5 RESEARCH POSITION OF THIS PAPER

This paper attempts to reduce the non-physical descriptions in relativity to genuine physical mechanisms, acting as a supplementary extension of the relativistic theoretical system.

5.1 Core Equation Derived from Light Pressure Experiment

In light pressure experiments, incident light produces an apparent mass reading M_{vec} (vector mass). The corresponding force is:

$$F = M_{\text{vec}}g$$

Force generated by momentum change is:

$$F = \frac{\Delta p}{\Delta t} = \frac{\Delta(E/c)}{\Delta t}$$

Equating the two expressions:

$$M_{\text{vec}}g = \frac{\Delta(E/c)}{\Delta t}$$

Power is force multiplied by light speed:

$$P = Fc = M_{\text{vec}}gc$$

Vector energy is thereby defined as:

$$E_{\text{vec}} = M_{\text{vec}}gc$$

Energy conservation of light in gravitational field gives:

$$dE = -\frac{E}{c^2}g \cos \theta dr$$

Substitute the photon energy relation $E = hc/\lambda$:

$$-\frac{hc}{\lambda^2}d\lambda = -\frac{hc}{\lambda c^2}g \cos \theta dr$$

After simplification:

$$\frac{d\lambda}{dr} = \frac{g \cos \theta}{c^2} \lambda$$

Using $dr = c dt$, the fundamental dynamic equation of wavelength is obtained:

$$\frac{d\lambda}{dt} = \frac{g \cos \theta}{c} \lambda$$

5.2 Physical Interpretation of Time Dilation

For radial light propagation ($\cos \theta = 1$):

$$\frac{d\lambda}{dt} = \frac{g}{c} \lambda$$

With frequency relation $\nu = c/\lambda$:

$$\frac{d\nu}{dt} = -\frac{g}{c} \nu$$

Gravitational frequency shift is expressed as:

$$\nu = \nu_0 \exp\left(-\frac{\Delta\phi}{c^2}\right)$$

GPS time deviations are explained by physical frequency variation instead of intrinsic time dilation. This theory does not contradict the numerical calculation results of relativity, but reinterprets spacetime effects as real physical processes, and time itself remains absolute.

5.3 Cosmological Redshift

Integrate from emission ($r = 0, \lambda = \lambda_0$) to observation ($r = D_{\text{true}}, \lambda = \lambda$):

$$\int_{\lambda_0}^{\lambda} \frac{d\lambda}{\lambda} = \frac{1}{c^2} \int_0^{D_{\text{true}}} \bar{g} dr$$

Assuming $\bar{g}$ is the path-averaged gravitational field strength, we obtain:

$$\ln \frac{\lambda}{\lambda_0} = \frac{\bar{g} D_{\text{true}}}{c^2}$$

From redshift definition $1 + z = \lambda/\lambda_0$:

$$1 + z = \exp\left(\frac{\bar{g} D_{\text{true}}}{c^2}\right)$$

5.4 Physical Reduction of Spatial Expansion

In the standard cosmological model, cosmic redshift is interpreted as the expansion of space itself. In Absolute Theory, absolute space is non-physical and cannot expand or contract. The so-called “spatial expansion” is not a real physical process.

The redshift phenomenon is essentially the wavelength stretching of light during propagation in the gravitational field. In Absolute Theory, the redshift-distance relation is:

$$1 + z = \exp\left(\frac{\bar{g} D_{\text{true}}}{c^2}\right)$$

The corresponding true cosmic distance is:

$$D_{\text{true}} = \frac{c^2}{\bar{g}} \ln(1 + z)$$

The relativistic “spatial expansion” is physically reduced to the change of light’s own wavelength, which is consistent with the absolute space framework.

6 CONCLUSION

Based on the sole postulate that light propagates at a constant speed in absolute space, Absolute Theory derives the core dynamic equation from light pressure experiments, and reduces relativistic time dilation and spatial expansion to real physical processes such as frequency variation and wavelength stretching. Absolute void has no physical properties and cannot be measured directly, while light propagation behavior is a legitimate research object of physics. This paper provides a supplementary reduction framework for the relativistic theoretical system.

ACKNOWLEDGMENTS

The author thanks Doubao and DeepSeek for technical support in theoretical derivation and manuscript preparation.

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