Possibility of Ads space evolving into ds space

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This article puts forward a hypothesis.In this article, the derivative of the cosmological constant is positive, and there is a possibility that the constant evolves from negative in the early universe to positive in the later period. We assume that both macroscopic and microscopic systems are closed systems and the entropy of the system increases to 0. The entropy of the macroscopic open system increases and the entropy of the microscopic system decreases. We know that Adspace can constitute Ads/CFT theory, but there are serious difficulties with ds-space (experimentally, the universe is ds-spacetime). Assuming that the microsystem has a spontaneous entropy reduction process, Ads-space can evolve into ds-space.

Keywords:Ads space, ds space , evolved

I. INTRODUCTION

In mathematics and physics, an n-dimensional inverse de Sitter space is a maximal (with a perfect mirror image of the left half being the right half) Lorentzian manifold with constant negative scalar curvature. The inverse de Sitter space and de Sitter space are named after William de Sitter (1872-1934), a professor at Leiden University and director of Leiden, who worked closely with Albert Einstein at Leiden in the 1920s to study the spacetime structure of the universe.

The flow shape of constant curvature is most familiar in the two-dimensional case, where the surface of a world is a surface of constant positive curvature, a flat plane is a surface of constant zero curvature, and an exaggerated plane is a surface of constant negative curvature.

Einstein's general interpretation of relativity puts space and time on an equal footing, so one thinks/believes in the geometry of spacetime brought together, rather than space and time separated. The cases of spacetime with constant curvature are de Sitter space (positive), Minkowski space (zero), and anti-De Sitter space (negative). Thus, they are exact solutions of Einstein's null cosmic field equations with positive, zero, or negative constants.

The inverse de Sitter space can be generalized to any number of spatial dimensions. In higher dimensions, it is best known for its role in the back and forth writing of AdS/CFT, which implies the possibility of describing forces in mechanics in terms of the string interpretation (why something works or happens the way it does) in a certain number of dimensions (e.g. four dimensions), where strings exist in anti-Desit space with an additional (non-compact) dimension.

Desiderate space involves a difference in general relativity where spacetime is (a) small curved and has no matter or energy. This is the same relationship as between Euclidean and non-Euclidean geometry.

In the absence of matter or energy, the intrinsic curvature of spacetime is modeled by the constants (associated

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with stars and the universe) in general relativity. This is consistent with the energy density and pressure that the vacuum has. This spacetime geometry results in the separation of initially parallel timelikes (shaped like a soccer), with the spacelike part having positive curvature.

Anti-Desite-space (told to be different from) Desite-space The inverse de Sitter space in general relativity is like the de Sitter space, except that the sign of the curvature of spacetime is changed. In antidesitic space, there is no matter or energy, and the curvature of the space segments is negative, accompanied by an exaggerated geometry where initially parallel time segments (shaped like soccer balls) eventually intersect. This is accompanied by a negative (stellar and cosmic related) constant, empty space itself with negative energy density, but with positive pressure, unlike the standard model of our own universe, for which (observe, note or make statements about instances) distant supernovae point to a positive (stellar and cosmic related) constant, accompanied/matched by (asymptotic) de Sitter space.

In anti-Deseret space, as in Deseret space, the intrinsic spacetime curvature goes with the (stellar and cosmic related) constant.

Desiderate space and anti-Desiderate space are considered to be deeply embedded within and part of the five-dimensional space As mentioned above, the comparison used above describes the flatness of the curvature of a two-dimensional space caused by gravity in general relativity in a (with height, width and depth) embedded space, like the Minkowski space of special relativity. The five planar dimensions of the embedded de Sitter space and the anti-De Sitter space make the properties of the embedded space serious and stubborn. The distances and angles within the embedding space can be determined directly from the simpler properties of the five-dimensional flat space.

While anti-Desert space does not cooperate with the gravitational force of the watched (related to stars and the universe) constant in general relativity, anti-Desert space is thought to cooperate with (related to the tiny, weird motions of atoms) other forces in mechanics (such as the electromagnetic, weak and strong nuclear forces). This is known as the AdS/CFT back and forth writing.

When Λ is the cosmological constant about $\left(g^{\theta\theta}\right)^2$[3].We assume that the macro system and the micro system are closed systems, the system entropy increases to 0, the macro open system increases in entropy, and the micro system decreases in entropy. We know that Ads space can constitute Ads/CFT theory, while ds space has serious difficulties (experiments prove that the universe is ds space-time). Assuming that there is a spontaneous entropy reduction process in the microscopic system, the Ads space can evolve into a ds space.

II. NEW CLASS OF ACTION AND FIELD EQUATIONS

The purpose of this theory is that we find that the modified Einstein gravitational equation has a Reissner-Nodstrom solution in vacuum. First, we can consider the following equation (modified Einstein's gravitational equation).

The proper time of spherical coordinates is[1, 2]

$$ds^2 = G(t,r)dt^2 - \frac{1}{G(t,r)}dr^2 + \left[r^2 d\theta^2 + r^2 \sin^2\theta d\varphi^2\right] \tag{1}$$

$$R_{\mu\nu} - \frac{1}{2}g_{\mu\nu}R + \Lambda(\left(g^{\theta\theta}\right)^2)g_{\mu\nu} = -\frac{8\pi G}{C^4}T_{\mu v} \tag{2}$$

In this work, the action is given by the following relation which in the special case, reduces to the Einstein-Maxwell dilaton gravity:

$$S=\int d^4x\frac{1}{16\pi}\sqrt{-g}\left[R-\nabla_\mu\phi\nabla^\mu\phi-2\Lambda((g^{\theta\theta})^2)-e^{-2\Phi}F_{\mu\nu}F^{\mu\nu}\right], \tag{3}$$

where Λ is a function of the Ricci scalar R and Φ is the representation of the dilatonic field, also $F_{\mu\nu}=\partial_\mu A_\nu-\partial_\nu A_\mu$ (we set $8G=c=1$). Variation of the action with respect to the metric $g_{\mu\nu}$, the gauge A_μ and dilaton field Φ gives the following field equations:

$$\begin{aligned}&\Lambda_R R^\alpha_\nu+\left(\nabla_\mu\nabla^\mu\Lambda_R+\frac{1}{2}R\Lambda_R-\frac{1}{2}\Lambda\right)\delta^\alpha_\nu-\nabla^\alpha\nabla_\nu\Lambda_R\\&=2\nabla^\alpha\Phi\nabla_\nu\Phi+e^{-2\Phi}\left(2F_{\mu\lambda}F_{\nu\delta}g^{\alpha\mu}g^{\lambda\delta}-\frac{1}{2}F^2\delta^\alpha_\nu\right)\end{aligned} \tag{4}$$

$$\begin{aligned}&\nabla_\mu\left(\sqrt{-g}e^{-2\Phi}F^{\mu\nu}\right)=0\\&\nabla^2\Phi-\frac{1}{2}e^{-2\Phi}F^2=0\end{aligned} \tag{5}$$

where $\Lambda_R=\frac{d\Lambda(R)}{dR}$ and $\nabla_\mu\nabla^\mu\Lambda_R=\frac{1}{\sqrt{-g}}\partial_\mu\left(\sqrt{-g}\partial^\mu\right)\Lambda_R$. We also have $\nabla^\nu\nabla_\mu\Lambda_R=g^{\alpha\nu}\left[(\Lambda_R)_{,\mu,\alpha}-\Gamma^m_{\mu\alpha}(\Lambda_R)_{,m}\right]$.

In these equations we have:

$$\begin{aligned}&\nabla_\mu\nabla^\mu\Lambda_R=\frac{1}{\sqrt{-g}}\partial_r\left(\sqrt{-g}\partial^r\right)\Lambda_R=\left(G'\Lambda_R'+G\Lambda_R''+\frac{G}{r}\Lambda_R'\right)\\&\nabla^t\nabla_t\Lambda_R=g^{tt}\left[(\Lambda_R)_{,t,t}-\Gamma^m_{tt}(\Lambda_R)_{,m}\right]=\frac{1}{2}G'\Lambda_R'\\&\nabla^r\nabla_r\Lambda_R=g^{rr}\left[(\Lambda_R)_{,r,r}-\Gamma^m_{rr}(\Lambda_R)_{,m}\right]=\left(G\Lambda_R''+\frac{G'}{2}\Lambda_R'\right)\\&\nabla^\theta\nabla_\theta\Lambda_R=g^{\theta\theta}\left[(\Lambda_R)_{,\theta,\theta}-\Gamma^m_{\theta\theta}(\Lambda_R)_{,m}\right]=\frac{G}{r}\Lambda_R'\end{aligned} \tag{6}$$

From the tt and rr components of the field equations, one can easily show the following relation:

$$\nabla^r\nabla_r\Lambda_R=\nabla^t\nabla_t\Lambda_R\Longrightarrow G\Lambda_R''=0\Longrightarrow\Lambda_R''=0 \tag{7}$$

This leads to:

$$\Lambda_R=z+yr \tag{8}$$

In this relation, y and z are just two integration constants and assumed to be positive from avoiding non-physical ambiguity.

III. SUMMARY

This article puts forward a hypothesis.In this article, the derivative of the cosmological constant is positive, and there is a possibility that the constant evolves from negative in the early universe to positive in the later period. We assume that both macroscopic and microscopic systems are closed systems and the entropy of the system increases to 0. The entropy of the macroscopic open system increases and the entropy of the microscopic system decreases. We know that Adspace can constitute Ads/CFT theory, but there are serious difficulties with ds-space (experimentally, the universe is ds-spacetime). Assuming that the microsystem has a spontaneous entropy reduction process, Ads-space can evolve into ds-space.

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