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A CORRELATION OF EINSTEIN'S COSMOLOGICAL CONSTANT IN ANTI-DE SITTER
SPACETIME WITHOUT NEGATIVE VACUUM PRESSURE

Abstract

Dark energy has become an exceedingly significant dilemma in theoretical physics because it causes our universe to expand rapidly, being a vital element of cosmology. Recently, students of the Wolfpack CubeSat Development Team (WCDDT), the first middle school group of students to design, build, test, and fly their very own CubeSats, have found a duality with Einstein's cosmological constant: high temporal velocity of matter combined with the non-Euclidian nature of spacetime causes the universe to expand, which is observed as a phenomenon known as dark energy. For this to work, however, one of the dualities in general relativity is that the cause of gravity is the rotation of the temporal velocity. The other is that objects "roll" down the gravitational space. This parallel creates the same results for general relativity but not for this theory. It can be shown that the necessary curvature fits within the margin of error for the curvature of spacetime. This theory does predict a future heat death hypothesis. Existing proof of this hypothesis includes inflation and redshift. This theory predicts inflation in anti-de Sitter spacetime, the simplest negatively curved spacetime continuum because all particles via their ultra-high observed relative velocities at many times the speed of light due to time dilation, which would be considered inflation.

The former is done because it will capture the essence of a 3+1D universe without the mathematical complexity and allow for entirely analytic solutions. In addition, a 2+1D is much more intuitive and easier to visualize, and Möbius transformation can be used. The paper will then show that the critical behaviors of the 2+1dimensional universe apply in a 3+1 dimensional universe. We will do the mathematical calculations in stereographic coordinates, allowing the consideration of many different curvatures to find the one that produces the desired dark energy strength. Evidence for anti-de Sitter spacetime, required for this theory, is numerous. Not only is it a prevailing physics theory including a uniqueness theorem entailing a negative cosmological constant implying negative spacetime curvature, but because circles in hyperbolic geometry have a circumference that grows exponentially with the radius, this is a duality with the Hubble constant and, therefore, is a duality with the Friedmann equations, the primary theory of dark energy. Some may say that a near-zero curvature is improbable, but anthropic bias solves this problem. In conclusion, the authors believe that the non-euclidean nature of anti-de Sitter spacetime causes dark energy.