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The cosmological constant is remarkably close to where is the currently measured age of the universe. This has led to the introduction of models with a time dependent cosmological constant. (citations). The existence of such models raises the question: is there a time dependent formula that predicts the exact value of the cosmological constant? In this short note, I first present such a formula. I then suggest a physical interpretation of it. I do not try to derive the formula from known physics. Rather, my aim is much more modest. It is to present a simple formula that has a natural physical interpretation and that yields the exact measured value of the cosmological constant. How such a formula is related to other theories of cosmological expansion is a matter for another much more extensive inquiry.

Let be a Planck moment. Then is the number of Planck moments since the Big Bang. Let be the harmonic number. Now consider the following formula.

When , this formula yields an exact match with the measured value of the cosmological constant: . This is a striking mathematical fact. The Harmonic function is one of the simplest and most beautiful mathematical functions, one that is implicated in many physical structures. That such a simple time dependent formula involving the harmonic function yields an exact match of the cosmological constant is either a notable coincidence or is an indication of the structure of physical reality. As I haven’t derived the formula from specific physical assumptions, the physical interpretation of this fact remains unclear. So, it must be acknowledged that this intriguing mathematical alignment might be a mere curiosity. Nevertheless, one can entertain a physical interpretation through a bit of reverse engineering, starting from the formula’s structure.

Note first that the formula has the form:

If X is defined as the square of the B field, and the magnetic constant μ is set to 4π, this formula simplifies to , representing the strength of the magnetic field in a vacuum. Therefore, I suggest that is the appropriate expression for the square of the B-field in observable spacetime, and the cosmological constant corresponds to the strength of the magnetic field in a vacuum within observable spacetime. Recent findings indicate that the universe's expansion closely aligns with the expansion expected from a magnetic force generated by dark matter particles, rather than dark energy. (citation) To understand particles that might yield energy according to this formula, consider as the energy of particles subject to the Einstein-Planck relation, with wavelengths ranging from 1 to. It is conceivable that the existence of such particles imposes an intrinsic quantum structure on 4-dimensional spacetime, resulting in a vacuum magnetic field strength equal to the square root of the average energy of all such particles divided by the magnetic constant.