Complementary clarifications to the Einstein-VED theory

This document provides a mathematical basis to understand the concepts of this theory. I intend to expose the most elementary mathematical bases that need to be known to understand this work. This includes basic concepts of algebra and set theory within reach of any person with a minimum of mathematical culture, not with the intention of making a confusing text but so that the rigor of my statements can be verified. That is why it is necessary to briefly explain basic concepts such as the differential, the limit, and the Lorentz transformations that give rise to this extension of Einstein's theory of spatial relativity.

With this basis, my Einstein-VED theory can be better understood.

The theory that will reconcile Quantum Mechanics with Einstein's Relativity (PDF in Spanish)

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I see a deep connection between mathematics and the laws that define nature. Through number theory we can bound and describe the rules that govern the universe.

First, let's think about matter: even if the universe contained infinite particles, that set would still be countable. In other words, each particle could correspond to a natural number:

$$n \in \mathbb{N}$$

Therefore, matter is subject to the properties of natural numbers.

Now, nature also shows continuity: between two instants or two points there is always another intermediate. If we take two real numbers t_0 and t_1, there always exists a number t such that:

$$t_0 < t < t_1$$

And this holds even if t_0 and t_1 are as close as we want. From here the concept of differential arises.

When we consider the difference $\Delta t = t_1 - t_0$, and we make that quantity smaller and smaller without reaching zero, we enter the domain of infinitesimals. We can make Δt as small as we want, and yet there will always be another smaller one. This process naturally leads to the concept of limit.

A limit is that which we can approach infinitely: no matter how close we are, there is always a closer value. That is why, when in calculus we speak of differentials, it is not about dividing by zero, but about approaching an impossible division without actually performing it.

Differentials allow us to work with magnitudes that tend to zero but are never zero, and that gives us the mathematical basis for the continuity of space-time.

Thus, we take $\mathbb{R}$ as the representation of that continuity in each dimension. The universe, in this sense, can be seen as a space of four real dimensions:

$$\mathbb{R}^4$$

which contains a number n of particles, with:

$n \subset \mathbb{N}$

In this way, the universe combines the discrete (matter, natural numbers) and the continuous (space-time, real numbers). Both are related through the concepts of limit, differential and continuity, which are also reflected in Lorentz's laws and in the structure of modern physics.