Zenon Manifold

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Abstract

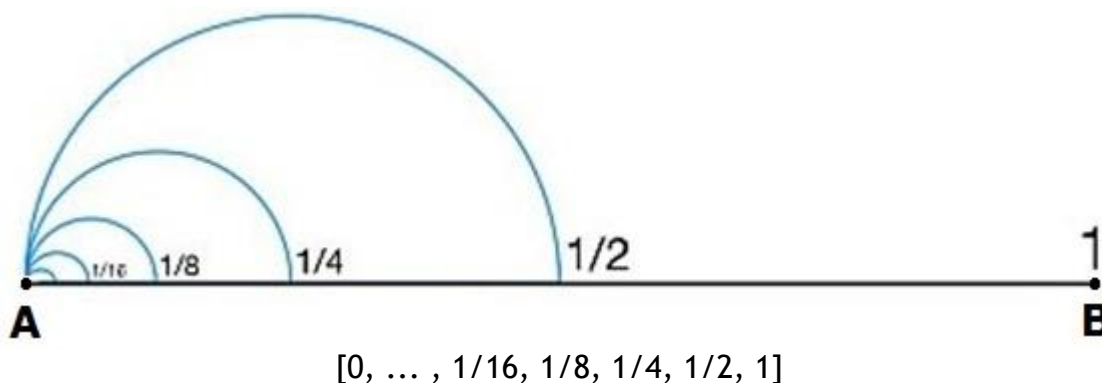Ensuing from first principles, I suggest pre-geometric theory of spacetime [1], in which the apex of light cone 'here and now' is not modeled with dimensionless point [2], but with non-trivial mathematical object along *null intervals*, endowed with brand new structure, topology and dynamics (contrary to Robert Geroch [3]), and defined on so-called Zenon manifold [4].

Manuscript available upon request.

1. Introduction

According to David Hilbert, an old French mathematician claimed that, if you suggest a new mathematical theory, it could not be considered complete until you have made it so clear that you can explain it to the first man whom you meet on the street. Let me try.

As told by Aristotle (*Physics* VI:9, 239b10), Zeno of Elea (490-430 BC) has formulated the famous dichotomy paradox: That which is in locomotion must arrive at the half-way stage before it arrives at the goal. In the drawing below, if we imagine **B** going back to **A**, then **B** will **stop** *only* at the ultimate limit **B≡A**, which denotes one single dimensionless point [2], and locomotion will be impossible.

[0, ... , 1/16, 1/8, 1/4, 1/2, 1]

The only possible solution to the paradox above is to endow *every* point in [**AB**] with structure, topology and dynamics from the Heraclitean *flow of events* (p. 11 in [1]): replace **B≡A** with the elementary step of time AB depicted with Fig. **2c** at p. 14 in [4]. Contrary to the speculations in current GR textbooks [3], I suggest **perfect** continuum of spacetime points as 4D events called 'atoms of geometry' (Fig. 3 at p. 7 and p. 12 in [4]) defined on a brand new pre-geometric manifold, dubbed *Zenon manifold*. In one sentence, I introduce Heraclitean time (p. 11 in [1]) "inside" geometric points AB (read above) to solve the problem of continuum: all points from the number line (p. 39 in [1]) follow the Heraclitean time (Fig. **2c** at p. 14 in [4]) without *any* gaps whatsoever. Simple, isn't it?

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16 April 2019, 19:18 GMT

References and Notes

1. D. Chakalov, *Platonic Theory of Spacetime*. 10 February 2019, 46 pp., at this http URL.

2. C. Stover and E. Weisstein. "Point." From MathWorld — A Wolfram Web Resource. http://mathworld.wolfram.com/Point.html

3. Robert Geroch, *General Relativity from A to B*, University of Chicago Press, 1978, p. 21. Robert Geroch and Gary Horowitz, *Global Structure of Spacetimes* (1979) at this http URL.

4. D. Chakalov, *Spacetime Engineering*. 2 April 2019, 16 pp., at this http URL.