

The meaning of the infinitely great

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Abstract The infinitely small is defined as finite length quantity of one dimension without the sizes of space ,while the infinitely great is reached by the superpositions or accumulations of infinitely many of the finite quantity by the way of the change of direction. The change of direction indicates that there is an leap from a finite quantity to finite quantities of infinitely many(infinitely great) and the form of manifestation of infinitely great is one quantitative continuum that can not be carried out by any algorithms and all parts of space (including circumferential length) we see is this one quantitative continuum. The any value is the value of this one quantitative continuum implied the infinitely great that compresses any quantities outside of it to zero.

Running title: the infinitely great

The superpositions for extending from infinitely small to infinitely great is executed in an unit of 0 in axiom1¹.Starting from the first 0,the continue superpositions is gradually close to an given length quantities.Further we can say that the superpositions to be carried on forever will reach an infinitely great if it exists.Consequently, the character of extending from infinitely small to infinitely great in axiom1 can be described that for any a given length quantity there is already a more larger quantity than it. In this sense,it is said that the infinite quantities is the overcoming of the finite quantities. Assuming an infinitely great, quantity in the front of this infinitely great is not infinitely great due to it is smaller than that. Thus it is illogical that shifting from finite to infinite only need add an 0 .In addition, It is aslo illogical for us to say that the maximum quantity (infinitely great)is non-existence due to the fact that for any a given length quantity there is already a more larger quantity than it.So it is wrong for us to say that infinite quantities is the overcoming of the finite quantities ,Consequencely, axiom1 needs to be revised.

Now the infinitely great is defined renewly as the term that the infinitely great indicated the accumulations of infinitely many quantities must be existence and and it is quantities you can't talk about anything outside of it and compressing any quantities outside of it to zero. Compared with the superpositions is gradually close to an given length quantities and this superpositions to be carried on forever will reach an infinitely great that is the overcoming of the finite quantities in axiom 1,this new infinitely great defined is that the superpositions of infinitely small to be carried on forever can aslo not reach this infinitely great (we called this revised axiom 1 as axiom 3).

The superpositions of infinitely small is not close to the infinitely great owing to extending forever of infinitely small can aslo not reach the infinitely great.That is to say that quantities of continue superpositions of infinitely small only remain in the finite range and size can not be compared between infinitely small and its quantities of superpositions(infinitely small is the same size as its quantities of superpositions).Further speaking,there is not the minimum and maximum quantity in the finite range,and the front (decrease)one and the behind (increase)one of infinitely small can be randomly extended without bounds in the finite range.Therefore, it is meaningless that infinitely small is 0 point,Instead of, the infinitely small is defined as finite length quantity of one dimension without the sizes of space and time. In brief, we call it as the finite quantity in the following

discussion. Seeing figure 1.

..... | | | | (finite extension)

Figure1 There is not the minimum and maximum quantity in the finite range, and the front (decrease) one and the behind (increase) one of infinitely small can be randomly extended without bounds in the finite range. So infinitely small is defined as finite length quantity of one dimension without the sizes of space and time.

By virtue of the sequential (or continue) superpositions of finite quantities only stay in the finite range, then how to achieve the superpositions of infinitely many quantities? I find that superposing through the way of the change of direction indicates the accumulations of infinitely many. Seeing figure 2. The infinitely great is reached by the superpositions or accumulations of infinitely many of the finite quantity by the way of the change of direction. The change of direction is equal to the definition of the infinitely great that you can't talk about anything outside of it and it compresses any quantities outside of it to zero, and you can not reach it by extending forever of finite quantities.

Now the definition of this new infinitely great are summarized in the following outline.

- (1), you can't talk about anything outside of it and it compresses any quantities outside of it to zero.
- (2) you can not reach it by extending forever of finite quantities
- (3) It is reached by the superpositions or accumulations of infinitely many of the finite quantity by the way of the change of direction.
- (4) Since continue superpositions of finite quantities only stay in the finite range, Achieving the superpositions (or accumulations) of infinitely many quantities of finite quantities will be a leap from finity to infinity, not continue superpositions.

Further, we see some detailed characters about this infinitely great below.

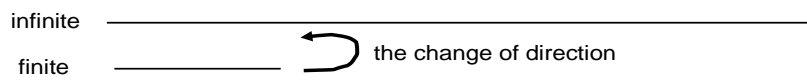


Figure 2 The infinitely great is reached by the superpositions or accumulations of infinitely many of the finite quantity by the way of the change of direction .

Character1 Since the change of direction suggests that accumulations of the most quantities(infinitely many or infinitely great),so infinitely great can be defined as quantities that can compress anything outside it into nothing and can not be talked about any quantities outside it .Containing the whole quantities can be indicated by infinitely many,which means that all quantities can be included by one system where it distincts from axiom1.

Character2 The infinitely great can be described from character1 as point that is unlimited,open,opposite to L point.Seeing figure 3. From this property of the infinitely great we understand cosmos as open space.

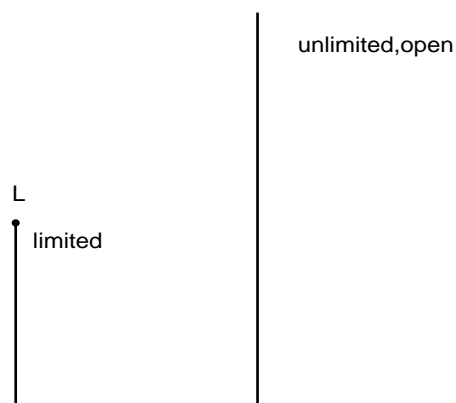


Figure 3 The infinitely great can be described from character1 as point that is unlimited,open,opposite to L point .

Character3 Considering a finite quantities whose sequential superpositions can only remain within the finite range, and this finite quantities does not distinct from its sequential superpositions (increase or decrease) in sizes. Therefore, there is a finite length quantities without the sizes of space and time whose accumulations of infinitely many are made of infinitely great. So far the accumulations of infinitely many implied by the change of direction indicates an leap from a finite quantity to finite quantities of infinitely many. Supposing this finite quantity as 1, we have a relationship: $\infty/1=\infty$. ∞ suggests infinitely great. The reason for saying leap is that the distance relationship between 1 and ∞ is leap. Seeing figure 4 in which relationship between finite quantity and infinite quantities are described.

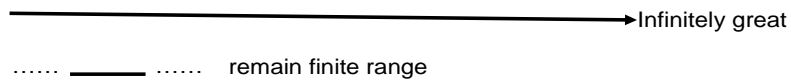


Figure 4 The accumulations of infinitely many implied by the change of direction indicates an jump from a finite quantity to finite quantities of infinitely many .

Character 4 It is known from figure 4 that the change of direction indicates only two quantities existing: finite quantity and infinite quantities. Thus it is said that some quantity is only finite quantities before it does not reach infinite quantities and only remain within finite location. When this finite quantity leap into infinitely great quantity by the change of direction, the nearest infinite quantity to finite quantity is the starting point I in figure 5. The point I is identical to end point E due to property of the change of direction, which is different from axiom 1 in which the sequential (or called continual) superpositions can get random length quantities.

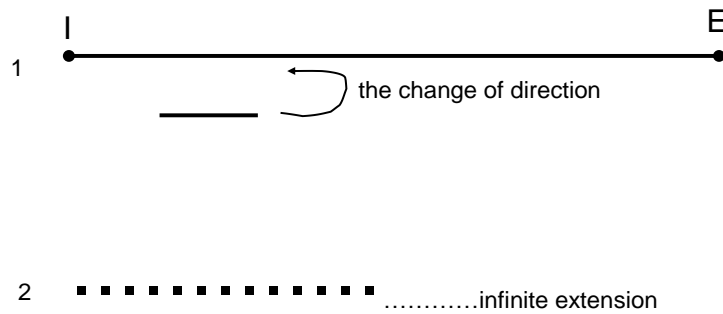


Figure 5 When this finite quantity leap into infinitely great quantity by the change of direction, the nearest infinite quantity to finite quantity is the starting point I in figure 5. The point I is identical to end point E due to property of the change of direction ,which is different from axiom1 in which the sequential (or called continual)superpositions can get random length quantities.

Character 5 It is known from figure 2 that the change of direction indicates that the second quantity of this infinitely great quantity can only be given on the basis of form of figure 6. It can be seen from figure 6 that the first quantity and the second quantity extend parallelly and do not intersect in infinitely distance (infinitely many).Although the second quantity is meaningless, the property of sizes of infinitely great has been defined here.As a result, I draw an conclusion that infinitely many quantities suggested by the change of direction exists in one quantitative way(there is only one quantity). The continuum is indicated by one quantitaty. Therefore ,the accumulations of infinitely many(infinitely great) is manifested by the continuum. So the non-continuum consisted of by countless 0 points is non-existence.

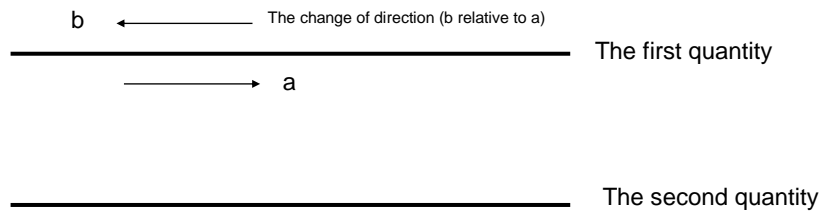


Figure 6 The accurate definition of the change of direction. The change of direction is defined as the second quantity that extend parallelly and doesn't intersect at infinite distance (infinitely many) with the first quantity in order to find this change of direction . This definition is aslo suitable for extension parallelly of two infinite quantities of infinite dimensions.

Character 6 Here I emphasize that it is not one quantitative continuum but the change of direction that indicates accumulations of infinitely many. The one quantitative continuum is the form of manifestation of the change of direction. The two features are included in this one quantitative continuum. Firstly, the continuum exists as an unity where its any parts is itself that can not segmented into less parts or bigger parts. As an specific example, An circumference of circle can not be selected out as the parts that are different from the other parts . Secondly, the change of direction indicates infinitely great, which means that the any parts of this continuum is this infinitely great.

Character 7 Where is switching point from finite quantities to infinite quantities if both co-exist within a system as the same axiom1. So the rationality of switching from finite quantities to infinite quantities indicated by the change of direction is validated from above point of view. The change of direction suggests finite quantities is not part of infinite quantities. Seeing figure 4. Thus both space and time we see in the common sense is one quantitative continuum representing infinitely many quantities where finite quantities have no place to exist and it is only reference quantities to define infinitely many quantities. As a reslt, it is meaningless trying to look for 0 point suggesting infinitely small in the common sense because of infinitely great being only existence. Therefore, the definite values of each length or scale of space and time have been given in accordance with character 5 and 7 and all of them are one quantitative continuum representing infinitely many quantities.

Character 8 The facts that there is only one quantity to exist and there is no second quantity to

select is indicated by the change of direction representing the accumulations of infinitely many quantities, which mean that this one quantitative continuum can not be carried out by the algorithms of 'include' expressed by $()$ and 'equal divide' expressed by $/$ as axiom 1 do. In other words, the operations of addition, subtraction, multiplication, division can not be established by this one quantitative continuum of the change of direction representing infinitely many quantities due to uniqueness of this one quantitative continuum. Thus infinitely many quantities indicated by the change of direction, being equivalent to term that superposing forever of finite quantity can also not reach, can only be expressed by using the way of size property described by character 5, not by using the way of gradually increase number of 31415962.....(extending forever) or 45879.....(extending forever), and so on.

Character 9 It is shown From 8 that the operations of addition, subtraction, multiplication, division can not be established by this one quantitative continuum of the change of direction representing infinitely many quantities due to uniqueness of this one quantitative continuum. As a result, A conclusion is drawn that the quantitative values and dimensions are the same thing, it is unity in which its random parts is this infinitely great quantities. Thus we call this unity as infinite quantities of infinite dimensions. All quantities we can find is this one quantitative continuum. For the same reason, any point, line, or plane, or any outline of having properties of gradually increase dimension draw in space, such as circle, is meaningless. In this sense, it is also meaningless for us to say that space and time are curved. The concept that space and time is made of countless 0 is replaced by the concept of one quantitative continuum indicated by the change of direction expressing the accumulations of infinitely many quantities. Further, A infinitesimal is non-existence. Instead of, there is only one quantity to exist that it is a continuum indicated the accumulations of infinitely many quantities.

For example, The circumference of a circle can be of course not selected out from this unity of infinite quantities of infinite dimensions and is of course the part of one quantitative continuum, which indicates that the accurate value of circumference of a circle to its diameter (π) is 1 due to there is only one quantity to exist. Further, any given circle circumferential length (the parts of space of the one quantitative continuum) is this infinitely many quantities indicated by the change of direction.

Character 10 From Character 1 and 3, the any integer solution that has not integer solution in a finite range in axiom 1 can obtain a definite value in a infinite range in a change of direction suggesting infinitely many, such as $4/3, 7/6, 2^{1/2}, \pi$, et al, including all quantities we can find. The concept that any length can be randomly and infinitely divided into less parts have been replaced by that of the change of direction in which formula expressed by $\infty () 1 = \infty, \infty () \infty = 1$. Here 1 is finite length quantity of one dimension without the sizes of space, ∞ is infinitely many quantities that is defined as the concept that the superpositions of 1 to be carried on forever can also not reach ∞ . All infinite quantities implemented by an change of direction is carried out by the ways $\infty () \infty = 1$. Within this infinitely many quantities suggested by the change of direction, there is no difference between an odd number and even number, and also no difference between an prime number and an sum number.

Character 11 In addition, It is emphasized particularly here that one quantitative continuum representing infinitely many quantities means that any operations, such as the operations of addition, subtraction, multiplication, division, can not be implemented on it. As axiom 1 mentioned in the first paragraph, Assuming quantities beside, behind and in front of this infinitely great being

existence(quantities after the change of direction), it is only determined by property of the change of direction that there is no difference between this infinitely great and quantities beside, behind and in front of it . Namely, The infinitely great have been reached by quantities beside ,behind and in front of it as well .The distance between finite quantities and infinite quantities is also the relationship in figure 4.

Consequently, The infinite value of π and the definite values of other each length or scale of space and time have been given in this article. In order to define briefly and conveniently the concept of the infinitely great indicated by the change of direction ,the model of one dimension is adopted in figure 1-6 in this article. So some readers may ask, what position the infinite dimensions is within infinitely many quantities indicated by the change of direction? Namely how to understand and define accurately it? For instance, what is relationship between beginning and end of time? In the next paper, I will focus on illustrating the meanings of dimensions in infinitely many quantities resulting from the change of direction.

Reference

1 Qing Li . A non-continuum of the infinitesimal superposition. (unpublish data)

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