One Proposal about the nature during our time and space

Koji Ichidayama
Okayama 716-0044, Japan
E-mail: ichikoji@lime.ocn.ne.jp
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Abstract. It made that the new symmetric property, the binary law, existed newly in our time and space at the thing except the symmetric property of the principle of general relativity which is already known in this paper clear.
The introduction of this symmetric property will have made dealing with the position tensor of us handy as much as the surprise.

1 Introduction

The new symmetric property during the time and space of us who propose by this paper is equal to the symmetric property of the already known principle of general relativity. It is a symmetric property with big scale as to be. This symmetric property is caused by the mathematical law in the purity than, the physical law, the symmetric property about the dealing with the summation of the tensor. In the following chapter, it considers this thing and it proves a symmetric property about the dealing with the summation of the tensor first and it makes a new symmetric property during our time and space clear using this next.

2 One Proposal about the nature during our time and space

First, it considers about the symmetric property about the dealing with the summation of the position tensor.
When showing the ingredient $x^1, x^2, x^3, x^4$ of the position vector during our time and space in $x^\mu$ [1], it decides to show the summation of these ingredients as follows.

\[ X^\mu = \sum_{\mu=1}^{4} x^\mu \]  \hspace{1cm} (2.1)

Incidentally, because each of the ingredients are independence, they may use either of $X^\mu, x^\mu$ when showing a position vector but suppose that it uses $X^\mu$ in this paper.
The (2.1) formula can be shown as follows when differentiating (2.1) formula first here with ingredient $x^1$ and doing the operation to integrate again next about $x^1$ in $x^4$.

\[ X^\mu = x^1, X^\mu = x^2, X^\mu = x^3, X^\mu = x^4 \]  \hspace{1cm} (2.2)

Incidentally, in the (2.2) formula, it used the nature that the ingredient $x^1, x^2, x^3, x^4$ of the vector are independence each other.
By the way, it finds that it is possible to treat more in the same way as the scalar by position
vector $X^\mu$ than the (2.2) formula here. Even if it replaces a scalar in the formula with the vector when the scalar of the vector differentiates, the logical contradiction doesn’t occur to the equation and if using this thing, it finds the fact that it is possible to express in the following formula.

$$dX^\mu = \frac{dX^\mu}{dX^\nu}dX^\nu$$ \hspace{1cm} (2.3)

This formula is the differential calculus relational expression among two position vectors. If using this style, two position tensors $X^\mu, X^\lambda$ can be expressed by the following relational expression.

$$X^\mu = \frac{dX^\mu}{dX^\nu}X^\nu$$ \hspace{1cm} (2.4)

$$X^\lambda = \frac{dX^\lambda}{dX^\tau}X^\tau$$ \hspace{1cm} (2.5)

Therefore, the relational expression to this summation of two position tensors is from (2.4), the (2.5) formula.

$$X^\mu + X^\lambda = \frac{dX^\mu}{dX^\nu}X^\nu + \frac{dX^\lambda}{dX^\tau}X^\tau = \frac{dX^\mu}{dX^\nu}X^\nu + \frac{dX^\lambda}{dX^\nu}X^\nu$$ \hspace{1cm} (2.6)

From the inner product of the vector and the distribution law about the outer product. 

$$\left[ \frac{d(X^\mu + X^\lambda)}{dX^\nu} \right] X^\nu = \left[ \frac{dX^\mu}{dX^\nu} + \frac{dX^\lambda}{dX^\nu} \right] X^\nu = \frac{dX^\mu}{dX^\nu}X^\nu + \frac{dX^\lambda}{dX^\nu}X^\nu$$ \hspace{1cm} (2.7)

Incidentally, the vector in this place is a tensor. If using this, the (2.6) formula is

$$X^\mu + X^\lambda = \frac{d(X^\mu + X^\lambda)}{dX^\nu}X^\nu$$ \hspace{1cm} (2.8)

If comparing with the (2.4) formula, it finds that it is possible to treat the summation $X^\mu + X^\lambda$ of the position tensor in the same of one tensor.

From in the same way on the other hand, (2.4), the (2.5) formula of the relational expression to the product of two position tensors

$$X^\mu X^\lambda = \frac{dX^\mu}{dX^\nu} \frac{dX^\lambda}{dX^\tau}X^\nu X^\tau$$ \hspace{1cm} (2.9)

If comparing with the (2.4) formula, the product $X^\mu X^\lambda$ of the position tensor is different from the case with summation and it isn’t possible to be treated in the same of one tensor by it.

Here, it decides to examine (2.8) formula in detail. When first, transform (2.8) formula and differentiate both sides in $X^\nu$
Incidentally, this treatment in the case is the same with the scalar.

\[
\frac{dX^\nu}{dX^\nu} = \frac{d^2X^\nu}{d(X^\mu + X^\lambda)dX^\nu}(X^\mu + X^\lambda) + \frac{dX^\nu}{d(X^\mu + X^\lambda)} \frac{d(X^\mu + X^\lambda)}{dX^\nu} \tag{2.10}
\]

Because it is a clause of 1st of the right side, \( \frac{dS}{d(X^\mu + X^\lambda)}(X^\mu + X^\lambda) = 0 \) and moreover both sides are scalar quantity together and can change left side suffix \( \nu \) into \( \mu \)

\[
\frac{dX^\mu}{dX^\mu} = \frac{d(X^\mu + X^\lambda)}{d(X^\mu + X^\lambda)} \tag{2.11}
\]

It finds that there is not hinderance even if \( \mu \neq \lambda \) meets actually here because the formula of either of \( \mu = \lambda \) or \( \mu \neq \lambda \) of (2.11) stands up and treats as \( \mu = \lambda \) in case of treatment.

In other words, actually, the summation of the position tensor can be simpler treated. Incidentally, it is possible to say that the symmetric property of \( \mu = \lambda \) exists to the treatment of the summation \( X^\mu + X^\lambda \) of the position tensor about this thing, too.

By the way, it considers about how a summation with the position tensor which is a place of the substantial adaptation of the symmetric property in case of this treatment next is expressed by the equation.

The summation of the position tensor which shows a position on the time and space which is different here in the future decides to show the suffix of the tensor as the uppercase of the English letter.

Also, it decides to show the summation of all position tensors which compose our whole time and space specifically in \( X^I \).

First, if limiting relation to the relation of the position tensors, the relation that it is possible that it is possible to have some position tensor \( X^\mu \) is limited to the relation among all position tensors except \( X^\mu \).

This thing can be shown in \( X^\mu = f(\overline{X}^\mu) \) if deciding to represent \( X^\mu \) and the position tensor which is independence as being \( \overline{X}^\mu \).

Because it isn’t clear here about the concrete form of \( f(\overline{X}^\mu) \), the definite relational expression about \( X^\mu \) can not be gotten.

However, because the case where the relational expression can be fixed as prima facie only by the only mathematical request is only one, it makes clear about this case.

Because \( \overline{X}^I \) doesn’t exist, it becomes \( \overline{X}^I = 0 \) to only \( X^I \).

\( X^I = f(0) \) here, therefore, because \( X^I \) forms no kind of connection, the following formula can be set by it from \( X^I = f(\overline{X}^I) \).

\[
X^I = 0 \tag{2.12}
\]

Here, such nature is only pure mathematical request like the (2.12) formula because it is not and can not form an equation to the summation of the position tensor except \( X^I \). Therefore, the place of the substantial adaptation of the symmetric property in case of previously shown treatment is only the relational expression which was concerned with \( X^I \).

Next, it considers about making a symmetric property in case of treatment which was previously shown to the (2.12) formula be adaptable actually.

First, it takes the summation about the position tensor to be treating by the (2.8) formula
and it decides to show this in $X^J$.

$$X^\mu + X^\lambda + X^\nu = X^N + X^\nu = X^J$$  \hspace{1cm} (2.13)

The symmetric property in case of treatment which was previously shown here can be handled as follows if adaptable.

$$X^J = X^\mu + X^\nu$$  \hspace{1cm} (2.14)

This thing shows that it is possible to treat by making all tensors except $X^\nu$ the same in $X^\mu$ in case of treatment of $X^J$.

By the way, next, it thinks of $X^J$ and it thinks of extending in $X^I$.

First the relation between $X^J$ and $X^I$

$$X^I = X^J + X^M$$  \hspace{1cm} (2.15)

If therefore, substitute (2.13) formula

$$X^I = X^N + X^M + X^\nu = X^K + X^\nu$$  \hspace{1cm} (2.16)

Here, because it thinks that $X^N$ changed to $X^K$ only in case of $X^I$ and that the discussion to the (2.11) formula stands up in case of $X^K$, the symmetric property in case of previously shown treatment can be more handled as follows if adaptable than (2.13) formula.

$$X^I = X^\mu + X^\nu$$  \hspace{1cm} (2.17)

Therefore, $X^I$ can be $X^J$ in the same way treated and in case of treatment of $X^I$, all tensors except $X^\nu$ can be treated by making them the same in $X^\mu$.

By the dealing which shows (2.12) formula therefore, in (2.17)

$$X^\mu + X^\nu = 0$$  \hspace{1cm} (2.18)

This thing shows that it is possible to treat by making all tensors except $X^\nu$ the same in $X^\mu$ in all position tensors which compose our whole time and space.

The introduction of this symmetric property will have made dealing with the position tensor of us handy as much as the surprise.

A symmetric property in case of treatment of these us in the time and space is called a binary law in the future and the tensor to be considering this rule is called BINOR.
3 Discussion

It made that the new symmetric property, the binary law, existed newly in our time and space at the thing except the symmetric property of the principle of general relativity which is already known in this paper clear. The introduction of this symmetric property will have made dealing with the position tensor of us handy as much as the surprise. Moreover, it decided to call the tensor which satisfies this binary law this back BINOR. Incidentally, it plans to make the nature which is peculiar to BINOR clear with the continuing separate sheet of paper to this back this.

References

[1] P.A.M.Dirac, General Theory of Relativity (1975 by John Wiley & Sons, Inc.)

[2] Murray R. Spiegel, Theory and Problems of Vector Analysis (1974 by McGraw-Hill, Inc.)