The Conjugate Entangled Manifold of Space–Time Induced by the Law of Unity of Contradiction

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The Qualitative Grid Computer Based on Conjugate Entangled Manifold for Law of Unity of Contradiction

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Abstract. The emergence of the contradiction between two different objects u and v is attributed to a mechanism that their opposite position information is transmitted and is meeting at a contradiction point. To describe this mechanism, the paper constructed the Conjugate-Entangled Coordinate (CEC) System in which the invariances of the contradiction points can perform certain transformations, such as the phase switching of time and space, the scale transformation of the measurement unit, and the invariances of the contradiction point position transfers as the relative velocity ratio information of the two opposite objects changes. This CEC system was constructed by synthesizing the time-space coordinate and the space-me coordinate. It allows the Inner Product induced by the invariance of contradiction point changes from 0 to 1 as the relative velocity ratio information of the two opposite objects changes. This induces not only an integral for all contradiction points in interval $[0_x, 1_x]$ but also a Conjugate-Entangled Manifold, in which the invariance of Inner Product under the transformation and rotating of coordinate system can be represented.

Keywords: Information Transmission; Spatial-Time Coordinate; Conjugate-Entangled Manifold; Analytic Function; Entanglement of Inner Product; Qualitative Grid Computer

1 Introduction

According to Formal logic and Mathematical logic, there is no contradiction among the most basic laws of the world. On the contrary, dialectical logic believes that the world is full of contradictions, and regards "unity of opposites, mutual change between quality and quantity and negation of negation" as " The basic law of universal application".

Can the law of non-contradiction and the law of contradiction be reconciled? How to reconcile? These questions has long broken through the scope of philosophy, epistemology and logic, and has become a basic subject that must be studied in almost all fields involving mathematics, physics, chemistry, biology, psychology, intelligence, thinking, as well as sociology, economics, political science, military science, etc. The core question about how contradictions arise is the entrance to the study of contradictions.

The source of contradiction between two oppositions u and $v(v \neq u)$ has been attributed to whether there exist a non-zero distance $d(x_u, x_v) \neq 0$ or not? The contradiction of u and v is varying with time t has been conversed into the function of the distance $d(x_u, x_v)(\neq 0)$ vary with time t, $f(t) = f(d(x_u(t), x_v(t))$.

In mathematics, the distance of $x_u(t)$ and $x_v(t)$ can be represented by complex number $z_u(t, x)$ and $z_v(t, x)$ in Complex Coordinate, respectively, and the distance $d(x_u, x_v)$ is defined as the root of inner product of a pair of vectors $z_u(t, x)$ and $z_v(t, x)$: $d(x_u(t), x_v(t)) = \sqrt{z_u(t, x) \cdot z_v(t, x)}$. Since an inner product is not only a core concept throughout mathematics, physics and neural network, but also a polarization invariant quantity under coordinate translation, by it an Entangled Vector and Clifford Geometric Product can be induced too, as well as a category and a topos, such that Artificial Neural Network defined by Inner Product can be converted into computing of tensor follow.

The emergence of the contradiction between two different objects u and v is attributed to a mechanism that their opposite position information is transmitted and is meeting at a contradiction point. To describe this mechanism, the paper constructed the a coordinate system in which the invariances of the contradiction points can perform certain transformations, such as the phase switching of time and space, the scale transformation of the measurement unit, and the invariances of the contradiction point position transfers from 0 to 1 as the relative velocity ratio information of the two opposite objects changes.

It is shown that the time-space (or spatial-time) complex coordinate system can be obtained by shifting of the time (or space) axis to $t = -\frac{1_t}{2}$, and rotating the spatial (or time) axis by $\theta = \frac{\pi}{2}$, in which the mechanism of contradiction emerging and meeting at the contradiction point can be expressed as a function of the position component of a pair of conjugate complex numbers vary with time component (or on contrary) and meeting at the contradiction pointas, and by the transformation of plane-polar coordinates, even to expressed as a wave function.

It is also shown that, by a synthesizing of the time-space coordinate and the space-me coordinate, a Conjugate-Entangled Coordinate System can be constructed, in which the Inner Product induced by the invariance of contradiction point transfer as the relative velocity ratio information of the two opposite objects changes from 0 to 1. This induces not only an integral for all contradiction points in interval $[0_x, 1_x]$, but also a Conjugate-Entangled Manifold, in which the invariance of Inner Product under the transformation and rotating of coordinate system can be represented. It is known that inner product is a key concept across philosophy, mathematics and physics, and artificial neural networks, and can be defined by inner product. However, we propose that a qualitative mapping can be induced by inner product too such that a qualitative grid computer can be proposed in this way.

2 The Conjugate Coordinate System for Contradiction Point

The mechanism of the emerging of the contradiction between two objects u and v, which are separated by a unit distance, is attributed to that the location information of

u and v is transmitted to each other at unit velocities $\dot{x}_u(t)$ and $\dot{x}_v(t)$, respectively, from time $t = 0_t$, and meets at the midpoint of the line connecting u与v in a half of unit time $\frac{1_t}{2}$. or the contradiction point.

For the convenience of mathematical discussion, let "$x_u \equiv 0_x$" and "$x_v \equiv 0_x$" be located positions of two opposite objects u and $v(v \neq u)$, their distance is $\Delta(u, v) = \Delta(x_u, x_v) = \Delta x = x_v - x_u = 1_x - 0_x$, here $|1_x - 0_x|$ is the unit of distance. (Since

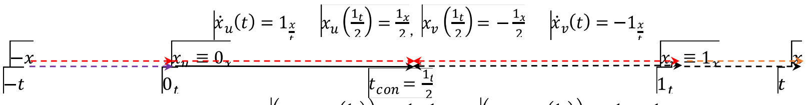


Fig1. Contradiction point $\left(t_{con}, x_u\left(\frac{1_t}{2}\right)\right) = \left(\frac{1_t}{2}, \frac{1_x}{2}\right)$ (or $\left(t_{con}, x_v\left(\frac{1_t}{2}\right)\right) = \left(\frac{1_t}{2}, -\frac{1_x}{2}\right)$) position information $x_u \equiv 0_x$ and $x_v \equiv 1_x$ respectively are moving at unit of velocity $\dot{x}_u(t) = 1_{\frac{x}{t}}$ and $\dot{x}_v(t) = -1_{\frac{x}{t}}$ forward to oppositions

there are not physical move of u and v, here x_u and x_v are only noted the position of u and v, respectively.)

Since $\Delta x_u(\Delta t) = \dot{x}_u(\Delta t)\Delta t$ and $\Delta x_v(\Delta t) = \dot{x}_v(\Delta t) \times \Delta t$ be the transformation function of the two information $x_u(\equiv 0_x)$ and $x_u(\equiv 1_x)$ is varied with time increment Δt, when $\Delta t = \frac{1_t}{2} = \frac{1_t - 0_t}{2}$, then the midpoint z_λ of the segment $\overline{x_u x_v}$ connecting x_u and x_v i.e, the interval $[x_u, x_v]$, which is called the contradiction point of two opposite objects u and $v(v \neq u)$. Then the distance between the two informations of $\Delta x_u(\Delta t)$ and x_v are respectively:

$\Delta x_u(\Delta t_u) = \dot{x}_u(\Delta t_u)\Delta t_u = \dot{x}_u\left(\frac{1_t}{2}\right)\frac{1_t}{2} = \frac{1_x}{2}$ （2.1）and

$\Delta x_v(\Delta t_v) = \dot{x}_v(t)\Delta t_v = \dot{x}_v(\Delta t)\frac{1_t}{2} = -\frac{1_x}{2}$ （2.2）

In other hand, since $\Delta t_v = (1_t - 0_t)$, $\dot{x}_u = \lim\limits_{(1_t - 0_t)\to 0}\frac{x_1 - x_0}{1_t - 0_t}$ and $\Delta x_u(\Delta t_u) = \sqrt{(\Delta t_u)^2 + (\dot{x}_u)^2}$, such that the triangle $\Delta z_{(0_t, 0_x)} z_{(1_t, 0_x)} z_{(1_t, 1_x)}$ can be constructed by three points of $z_0(0_t, 0_x)$, $z_{(0,1)}(1_t, 0_x)$ and $z_{(0,1)}(1_t, 1_x)$.

But $\Delta t_u = 1_t - 0_t = \left(1_t - \frac{1_t}{2}\right) + \left(\frac{1_t}{2} - 0_t\right)$ (2.3)

So we get that

$\Delta x_u(\Delta t_u) = \dot{x}_u \Delta t_u = \dot{x}_u(1_t - 0_t) = \dot{x}_u\left(\left(1_t - \frac{1_t}{2}\right) + \left(\frac{1_t}{2} - 0_t\right)\right) = \dot{x}_u^{\frac{1_t}{2}}\left(1_t - \frac{1_t}{2}\right) + \dot{x}_u^{0_t}\left(\frac{1_t}{2} - 0_t\right)$ (2.4)

Here $\dot{x}_u = \lim\limits_{(1_t - 0_t)\to 0}\frac{x_1 - x_0}{1_t - 0_t} = \frac{dx}{dt}_{|0_t}$ (2.5)

$$\begin{cases} \dot{x}_u^{\frac{1_t}{2}} = \lim\limits_{\left(1_t - \frac{1_t}{2}\right)\to 0}\dfrac{x_1 - x_{\frac{1}{2}}}{1_t - \frac{1_t}{2}} = \dfrac{dx}{dt}_{|\frac{1_t}{2}} = \dfrac{dx}{dt}_{|\frac{1_t}{2}} & (2.6-1) \\ \dot{x}_u^{0_t} = \lim\limits_{\left(\frac{1_t}{2} - 0_t\right)\to 0}\dfrac{x_{\frac{1}{2}} - x_0}{\frac{1_t}{2} - 0_t} = \dfrac{dx}{dt}_{|0_t} & (2.6-2) \end{cases}$$

$$\dot{x}_u^{\frac{1_t}{2}}\left(1_t - \frac{1_t}{2}\right) = \lim\limits_{\left(1_t - \frac{1_t}{2}\right)\to 0}\frac{x_1 - x_{\frac{1}{2}}}{1_t - \frac{1_t}{2}}\left(1_t - \frac{1_t}{2}\right) = \left(\frac{dx}{dt}_{|\frac{1_t}{2}}\right)\left(1_t - \frac{1_t}{2}\right) + (x_1 - x_{\frac{1}{2}}) \quad (2.7)$$

$\dot{x}_u^{0_t}\left(\frac{1_t}{2}-0_t\right)=\lim_{\left(\frac{1_t}{2}-0_t\right)\to 0}\frac{x_{\frac{1}{2}}-x_0}{\frac{1_t}{2}-0_t}\left(\frac{1_t}{2}-0_t\right)=\frac{dx}{dt_{|0_t}}\left(\frac{1_t}{2}-0_t\right)+\left(x_{\frac{1}{2}}-x_0\right)$ (2.8)

(2.7)+(2.8)

$\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\left(1_t-\frac{1_t}{2}\right)+(x_1-x_{\frac{1}{2}})+\frac{dx}{dt_{|0_t}}\left(\frac{1_t}{2}-0_t\right)+\left(x_{\frac{1}{2}}-x_0\right)$ (2.9)

since $\Delta t_v=(0_t-1_t)$, $\dot{x}_v=\lim_{(0_t-1_t)\to 0}\frac{x_0-x_1}{0_t-1_t}$ and $\Delta x_v(\Delta t)=\sqrt{(\Delta t)^2+(\dot{x}_v)^2}$, such that the triangle $\Delta z_{(1_t,1_x)}z_{(0_t,1_x)}z_{(0_t,0_x)}$ can be constructed by three points of $z_0(1_t,1_x)$, $z_{(0,1)}(0_t,1_x)$ and $z_{(0,1)}(0_t,0_x)$.

Since $\Delta t_v=0_t-1_t=\left(0_t-\frac{1_t}{2}\right)+\left(\frac{1_t}{2}-1_t\right)$ (2.10)

$\Delta x_v(\Delta t_v)=\dot{x}_v\Delta t_v=\dot{x}_v(0_t-1_t)=\dot{x}_v\left(\left(0_t-\frac{1_t}{2}\right)+\left(\frac{1_t}{2}-1_t\right)\right)=\dot{x}_v^{\frac{1_t}{2}}\left(0_t-\frac{1_t}{2}\right)+\dot{x}_v^{1_t}\left(\frac{1_t}{2}-1_t\right)$ (2.11)

Here$\dot{x}_v=\lim_{(0_t-1_t)\to 0}\frac{x_0-x_1}{0_t-1_t}=\frac{dx}{dt_{|1_t}}$ (2.12)

$$\begin{cases}\dot{x}_v^{\frac{1_t}{2}}=\lim_{\left(0_t-\frac{1_t}{2}\right)\to 0}\frac{x_0-x_{\frac{1_t}{2}}}{0_t-\frac{1_t}{2}}=\frac{dx}{dt_{|\frac{1_t}{2}}}=\frac{dx}{dt_{|\frac{1_t}{2}}} & (2.13-1)\\ \dot{x}_v^{1_t}=\lim_{\left(\frac{1_t}{2}-1_t\right)\to 0}\frac{x_{\frac{1}{2}}-x_1}{\frac{1_t}{2}-1_t}=\frac{dx}{dt_{|1_t}} & (2.13-2)\end{cases}$$

$\dot{x}_v^{\frac{1_t}{2}}\left(0_t-\frac{1_t}{2}\right)=\lim_{\left(0_t-\frac{1_t}{2}\right)\to 0}\frac{x_0-x_{\frac{1}{2}}}{0_t-\frac{1_t}{2}}\left(0_t-\frac{1_t}{2}\right)=\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\left(0_t-\frac{1_t}{2}\right)+\left(x_0-x_{\frac{1}{2}}\right)$ (2.14)

$\dot{x}_v^{1_t}\left(\frac{1_t}{2}-1_t\right)=\lim_{\left(0_t-\frac{1_t}{2}\right)\to 0}\frac{x_{\frac{1}{2}}-x_1}{\frac{1_t}{2}-1_t}\left(\frac{1_t}{2}-1_t\right)=\frac{dx}{dt_{|1_t}}\left(\frac{1_t}{2}-1_t\right)+\left(x_{\frac{1}{2}}-x_1\right)$ (2.15)

(2.14)+(2.15)

$\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\left(0_t-\frac{1_t}{2}\right)+\left(x_0-x_{\frac{1}{2}}\right)+\left(\frac{dx}{dt_{|1_t}}\right)\left(\frac{1_t}{2}-1_t\right)+\left(x_{\frac{1}{2}}-x_1\right)$ (2.16)

(2.8)+(2.16)

$\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\left(1_t-\frac{1_t}{2}\right)+(x_1-x_{\frac{1}{2}})+\left(\frac{dx}{dt_{|0_t}}\right)\left(\frac{1_t}{2}-0_t\right)+\left(x_{\frac{1}{2}}-x_0\right)+\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\left(0_t-\frac{1_t}{2}\right)+\left(x_0-x_{\frac{1}{2}}\right)+\left(\frac{dx}{dt_{|1_t}}\right)\left(\frac{1_t}{2}-1_t\right)+\left(x_{\frac{1}{2}}-x_1\right)=\left[\left(\frac{dx}{dt_{|1_t}}\right)-\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\right]\left(\frac{1_t}{2}-1_t\right)+\left[\left(\frac{dx}{dt_{|0_t}}\right)-\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\right]\left(\frac{1_t}{2}-0_t\right)=-\left[\left(\frac{dx}{dt_{|1_t}}\right)-\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\right]\left(1_t-\frac{1_t}{2}\right)-\left[\left(\frac{dx}{dt_{|0_t}}\right)-\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)\right]\left(0_t-\frac{1_t}{2}\right)$ (2.17)

Here $\left(\frac{dx}{dt_{|1_t}}\right)-\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)$ is the increment of the differential $\frac{dx}{dt}$ from $t=\frac{1_t}{2}$ to $t=1_t$, and $\left(\frac{dx}{dt_{|0_t}}\right)-\left(\frac{dx}{dt_{|\frac{1_t}{2}}}\right)$ is the increment of the differential $\frac{dx}{dt}$ from $t=0_t$ to $t=\frac{1_t}{2}$.

This is mean that the triangle $\Delta z_{(\frac{1_t}{2},\frac{1_x}{2})} z_{(\frac{1_t}{2},1_x)} z_{(1_t,1_x)}$ can be constructed by the product of the integration $\int_{\frac{1_t}{2}}^{1_t} \dot{x}_u^{\frac{1_t}{2}} dt$ and $\left(1_t - \frac{1_t}{2}\right)$. Similarly, the triangle

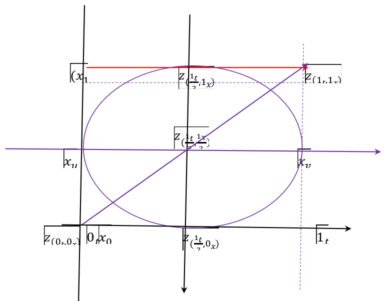


Fig.2 Two Triangles Constructed by the product of the integration $\int_{\frac{1_t}{2}}^{1_t} \dot{x}_u^{\frac{1_t}{2}} dt$ and $\left(1_t - \frac{1_t}{2}\right)$

$\Delta z_{(0_t,0_x)} z_{(\frac{1_t}{2},\frac{1_x}{2})} z_{(\frac{1_t}{2},0_x)}$ can be constructed by the product of the integration $\int_{0_t}^{\frac{1_t}{2}} \dot{x}_v^{\frac{1_t}{2}} dt$ and $\left(1_t - \frac{1_t}{2}\right)$. Therefore, sum of $\left[\dot{x}_u^{\frac{1_t}{2}}\left(1_t - \frac{1_t}{2}\right) + \dot{x}_u^{0_t}\left(\frac{1_t}{2} - 0_t\right)\right] + \left[\dot{x}_v^{\frac{1_t}{2}}\left(0_t - \frac{1_t}{2}\right) + \dot{x}_v^{1_t}\left(\frac{1_t}{2} - 1_t\right)\right]$ is the area of two reangles, one equals to the sum of a pair of triangles: $\Delta z_{(0_t,0_x)} z_{(\frac{1_t}{2},\frac{1_x}{2})} z_{(\frac{1_t}{2},0_x)} + \Delta z_{(\frac{1_t}{2},\frac{1_x}{2})} z_{(0_t,\frac{1_x}{2})} z_{(0_t,0_x)}$, other equal to the sum of triangles $\Delta z_{(\frac{1_t}{2},\frac{1_x}{2})} z_{(\frac{1_t}{2},1_x)} z_{(1_t,1_x)} + \Delta z_{(\frac{1_t}{2},\frac{1_x}{2})} z_{(1_t,\frac{1_x}{2})} z_{(1_t,1_x)}$.

Since there is a right hand spiral can be produced by the pair of triangles, by which a Clifford Geometric Product can be induced too. In adding, because $\Delta t_u = 1_t - 0_t$ as the measurement unit of time is very arbitrary, this is mean that there is not only the invariances of the Contradiction Point under the scale transformation of unit, but also an Entanglement between the pair of triangles, by which the opposite and unifying of contradiction between the u and v can be represented, can be induced.

By the comparison and analysis of 1, 2, 3 (2.4), (2.5), (2.6-1),(2.6-2),(2.12),(2.13-1),(2.13-2) and (2.17), It is found that the (2.17) is just a half of (2.5)+(2.12), this means that by subdividing of $[0_t, 1_t] = [0_t, \frac{1_t}{2}) \cup [\frac{1_t}{2}, 1_t]$, some of interesting of mathematical construction, such as the Clifford Geometric Product, Complex Analysis Function, and so on, could be produced by the position increment $\Delta x_u(\Delta t)$ and $\Delta x_v(\Delta t)$ varies with time increment Δt, if adding matters m_u and m_v then some of physical construction can be discussed in it.

It is need special to be point out that the scale of unit $|\Delta t_u| = |1_t - 0_t|$ is reduced by right spiral, but is expanded by left spiral, in the extreme, the entanglement between a pair of triangles could be changed to be the quantum entanglement, but the expanding of they could be conversed in to relative expanding.

Since Artificial Neural Unit is defined as a Inner Product, and an Attribute Grid Computer Based Qualitative Mapping, such that a Qualitative Grid Computer based

Conjugate Entangled Manifold can be build in this Frame.

It is natural to ask what coordinate system is for expressing some invariant of contradiction point under the transformation of time-spatial component? and how to achive it?

3 The Conjugate Entangled Coordinate System for Contradiction Point

Let the line from 0_t to 1_t be the time axis T^u for the time increment Δt, and translate it by $\frac{1_t}{2}$, then take the line of connecting x_u and x_v, $\overline{x_u x_v}$ as the space axis X^u, that for the position increment $\Delta x_u(\Delta t)$ variating with increment Δt, and rotate it by $\frac{\pi}{2}$, and get the time space Cartesian Coordinate System $Z^u = T^u \times X^u$. Then the coordinate of contradiction point $z_\lambda(t_\lambda, x_\lambda)$ in $Z^u = T^u \times X^u$ can be noticed by following: $z_\lambda(t_\lambda, x_\lambda) = z_{t_{\frac{1}{2}}}\left(t_{\frac{1}{2}}, x_{\frac{1}{2}}\right)$ (3.1)

Since the function of position increment of v, $\Delta x_v(\Delta t) = -\frac{1_x}{2}$ can be described in $Z^u = T^u \times X^u$ as the conjugate coordinate of $z_\lambda(t_\lambda, x_\lambda)$ noted by following: $\bar{z}_\lambda(t_{\frac{1}{2}}, -x_{\frac{1}{2}}) = \bar{z}_{t_{\frac{1}{2}}}(\frac{1_t}{2}, -\frac{1_x}{2})$ (3.2)

The formula (3.1) makes people believe that there is not necessary to set up a special coordinate system for describing the function of position increment of v.

However, due to the reverse transmission of information "x_u" and "x_v", such that not only a reciprocal convection between the two functions of position increment of u and v, $\Delta x_u(\Delta t)$ and $\Delta x_v(\Delta t)$ can be arisen at the contradiction point $z_{\frac{1}{2}}\left(t_{\frac{1}{2}}, x_{\frac{1}{2}}\right)$, by which but also a series of oppositions, conflicts and struggles could be produced. Therefore, it is necessary to provide a Coordinate System for representing the transmission increment function of x_v, $\Delta x_v(\Delta t)$ variating with time increment Δt.

Let the line from x_v to x_u be the space axis X^v, that for the position increment $\Delta x_v(\Delta t_v)$ variating with increment Δt, and rotate it by $-\frac{\pi}{2}$, then take the segment from 1_t to 0_t be the time axis T^v for the time increment Δt, and translate it by $\frac{1_t}{2}$, then take the segment of connecting x_v and x_u, $\overline{x_v x_u}$ as, and get the space time Cartesian Coordinate System $Z^v = X^v \times T^v$.

They are integrated to be a coordinate system: $W = Z^u \otimes Z^v = X^u \times (T^u \otimes X^v) \times T^v$, where $(T^u \otimes X^v)$ is the integration of T^u and X^v, in which the direction of T^u and X^v are opposites each other, and they are entangled each other in one, so it is called entanglement axis.

let T be the time axis, and X the spatial axis, and $Z = T \times X$ the complex coordinate system of time-spatial components, for $(t, x) \in T \times X$,let $x_u \equiv 0_x$ and $x_v \equiv 1_x$ be the spatial positions of two opposite objects u and v, such that the distance $\Delta(u, v) \equiv 1_x$, then "$x_u(\equiv 0_x)$" and "$x_v(\equiv 1_x)$" in $Z = T \times X$, can be noted by $z_u(t, x_u) \equiv z_u(0_t, 0_x)$ and $z_v(t, x_v) \equiv z_v(1_t, 1_x)$, respectively,and $\dot{x}_u(t) = 1_{x/t}$

and $\dot{x}_v(t) = -1_{x/t}$ the the transmiting velocity of position information "$x_u \equiv 0_x$" and "$x_v \equiv 1_x$", respectively, and the function of positiong information of "$x_u \equiv 0_x$" and "$x_v \equiv 1_x$" varying with t can be noted by $x_u(t)$ and $x_v(t)$ as following:

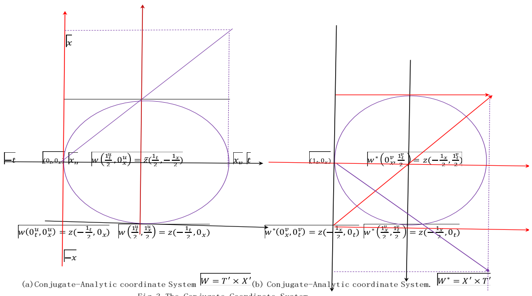
$$\begin{cases} x_u(t) = \dot{x}_u t \\ x_v(t) = \dot{x}_v t \end{cases} \quad (3.3)$$

It is shown a conjugate complex coordinate system can be got by two transformations as following: (1) Take time as first axis of the systems, and translates it by $t = -\frac{1_t}{2}$; (2) Take space as the secong axis of the system, and rotates it by $\theta = \frac{\pi}{2}$, (or (1') Take space as first axis of the systems, and translates it by $x = -\frac{1_t}{2}$; (2') Take time as the secong axis of the system, and rotates it by $t = \frac{\pi}{2}$,) can be noted by following :

$$\begin{cases} t^u = t - \frac{1_t}{2} \\ x^u = ix \end{cases} \quad (3.4)$$

It is obvious that a new Coordinate System can be got by (3.4), noted by $Z = T \times X$, and the position $x_u(t)$ and $x_v(t)$ at $t \in T$ and $x \in X$ in the coordinate $Z = T \times X$ can be represented by a pair of conjugate complex numbers as follow: $z_u(t, x_u) = t + ix_u(t)$ and $\bar{z}_v(t, -x_u) = t - ix_v(t)$. When time t equal to the meeting time equql to $t_\lambda = \frac{1_t}{2}$, and two transmited distances of the position information $x_\lambda^u\left(\frac{1_t}{2}\right) = \frac{1_x}{2}$ and $x_\lambda^v\left(\frac{1_t}{2}\right) = -\frac{1_x}{2}$. as shown in Fig.3.

Because the two couple of time and position $z_\lambda\left(t_\lambda, x_u^\lambda\left(\frac{1_t}{2}\right)\right) = z_\lambda(\frac{1_t}{2}, \frac{1_x}{2})$ and $\bar{z}_\lambda\left(t_\lambda, x_v^\lambda\left(\frac{1_t}{2}\right)\right) = \bar{z}_\lambda(\frac{1_t}{2}, -\frac{1_x}{2})$ can be represented, by a pair of conjugate complex $z_\lambda(\frac{1_t}{2}, \frac{1_x}{2})$ and $\bar{z}_\lambda(\frac{1_t}{2}, -\frac{1_x}{2})$, in Time-Spatial Complex Coordinate System $Z = T \times X$, and the time and space coordinates of the contradiction point are equl to the sum and



(a) Conjugate-Analytic coordinate System $W = T' \times X'$ (b) Conjugate-Analytic coordinate System. $W^* = X' \times T'$

Fig 3. The Conjugate Coordinate System

(1) Translatting $t = -\frac{1_t}{2}$ for the time axis of systems; (1') Translatting $t = -\frac{1_t}{2}$ for the spatial axis of systems;

(2) Spining of $\theta = \frac{\pi}{2}$ for the spatial axis。 (2') Spining of $\theta = \frac{\pi}{2}$ for the time axis)

diference of a pair of conjugate complex $z_\lambda(\frac{1_t}{2}, \frac{1_x}{2})$ and $\bar{z}_\lambda(\frac{1_t}{2}, -\frac{1_x}{2})$, respectively, as well as in space-time coordinate, $z_\lambda^*(\frac{1_x}{2}, \frac{1_t}{2})$,$\overline{z_\lambda^*}(\frac{1_x}{2}, -\frac{1_t}{2}) \in Z^*$, here $Z^* = X^* \times T^*$ is the space-time coordinate system, as shown in Fig.3.

Let w be the transformation from $Z = T \times X$ to $W(|W|, \Xi)$, $w: Z \to W = T^u \times X^u$, such that for $w(t^u, x^u) = z\left(t - \frac{1_t}{2}, x\right) \in Z = T \times X$, we have: $w(t^u, x^u) =$

$z\left(t-\frac{1_t}{2},x\right)$ (3.5)

Then the Coordinate of the origin point in $W=T^u\times X^u$ is

$$w(0_t^u,0_x^u)=z(-\frac{1_t}{2},0_x) \quad (3.6)$$

The coordinate of the contradiction point in $W=T^u\times X^u$ is

$$w_{\frac{1}{2}}\left(t_{\frac{1}{2}}^u,x_{\frac{1}{2}}^u\right)=z_{\frac{1}{2}}\left(0_t,\frac{1_x}{2}\right) \quad (3.7)$$

Let $W(|W|,\Xi)$ be the polar coordinate of contradiction point in the polar coordinate system $W(|W|,\Xi)$ can be writtred as a wave function formal as follow: as shown in Fig.4(a).

$$W(t^u,x^u)=|W|e^{i\theta}=|W|(cos\theta+isin\theta) \quad (3.8)$$

Let the interval $[x_u,x_v]$ be the segment connected the two objects u and v, $x_u(t)=\dot{x}_ut$ and $x_v(t)=\dot{x}_vt$ the position of informations x_u and x_v at t, then for the two velocities $\dot{x}_u$ and $\dot{x}_v$, there is a rate $\lambda=\frac{\dot{x}_u}{\dot{x}_v+\dot{x}_u}$, such that for $\forall\lambda=\frac{\dot{x}_u}{\dot{x}_v+\dot{x}_u}\in[0,1]$, $\exists z_\lambda(t_\lambda,x_\lambda)\in[x_u,x_v]$. When $\dot{x}_u=\dot{x}_v$, $\lambda=\frac{1}{2}$, $z_{\frac{1}{2}}\left(t_{\frac{1}{2}},x_{\frac{1}{2}}\right)$ is here contradiction point, so its coordinate in $W=T^u\times X^u$ can be noticed by

$$w_{\lambda=\frac{1}{2}}\left(t_{\frac{1}{2}}^u,x_{\frac{1}{2}}^u\right)=z_{\lambda=\frac{1}{2}}\left(0_t,\frac{1_x}{2}\right) \quad (3.9)$$

Let w^* be the transforpositon from $Z=T\times X$ to $W^*=T^v\times X^v=W^*(|W^*|,\Xi^*)$ $W=T^u\times X^u$ to, $w^*:W\to W^*$ such that for $z^*(x^v,t^v)\in X^v\times T^v$,

$$\begin{cases}x^v=x-\frac{1_x}{2}\\ t^v=it\end{cases} \quad (3,10)$$

we have: $w^*(x^v,t^v)=z^*\left(x-\frac{1_x}{2},t\right)$ (3.11)

$$w(t^u,x^u)=|w(t^u,x^u)|e^{i\theta}=|w(t^u,x^u)|(cos\theta+isin\theta) \quad (3.12)$$

$$w^*(x^v,t^v)=|w^*|e^{i\theta^*}=|w^*(x^v,t^v)|(cos\theta^*+isin\theta^*) \quad (3.13)$$

Then we get a other wave function: as shown in Fig.3(b)

(3.12)+(3.13) $W(t^u,x^u)W^*(x^v,t^v)+W^*(x^v,t^v)W(t^u,x^u)=|w||w^*|e^{i(\theta-\theta^*)}+|w||w^*|e^{-i(\theta^*+\theta)}=|w||w^*|\left(e^{i(\theta-\theta^*)}+e^{-i(\theta^*+\theta)}\right)=|w||w^*|e^{-i\theta^*}\left(e^{i\theta}+e^{-i\theta}\right)=2cos\theta|w||w^*|e^{-i\theta^*}$ (3.15)

(3.6)-(3.14) $W(t^u,x^u)W^*(x^v,t^v)-W^*(x^v,t^v)W(t^u,x^u)=|w||w^*|e^{i(\theta-\theta^*)}-|w||w^*|e^{-i(\theta^*+\theta)}=|w||w^*|\left(e^{i(\theta-\theta^*)}-e^{-i(\theta^*+\theta)}\right)=|w||w^*|e^{-i\theta^*}\left(e^{i\theta}-e^{-i\theta}\right)=2sin\theta|w||w^*|e^{-i\theta^*}$ (3.16)

(3.15)+(3.16) $W(t^u,x^u)W^*(x^v,t^v)-W^*(x^v,t^v)W(t^u,x^u)+W(t^u,x^u)W^*(x^v,t^v)+W^*(x^v,t^v)W(t^u,x^u)=W(t^u,x^u)W^*(x^v,t^v)+W^*(x^v,t^v)W(t^u,x^u)=2\left[cos\theta|w||w^*|e^{-i\theta^*}+sin\theta|w||w^*|e^{-i\theta^*}\right]=2e^{-i\theta^*}|w||w^*|(sin\theta+cos\theta)$ (3.17)

(3.16) +(3.17)

$W(t^u,x^u)W^*(x^v,t^v)=|w||w^*|e^{-i\theta^*}(cos\theta+sin\theta)=|w|\cdot|w^*|e^{-i\theta^*}+|w|\wedge|w^*|e^{-i\theta^*}$ (3.18)

(3.16)-(3.17)

$W^*(x^v,t^v)W(t^u,x^u)=|w||w^*|e^{-i\theta^*}(cos\theta-sin\theta)=|w|\cdot|w^*|e^{-i\theta^*}-|w|\wedge|w^*|e^{-i\theta^*}$ (3.19)

Formule (3.19) show us this is a Conjugate Coordinate in which the coordinate of contradiction point is $w^*_{\lambda=\frac{1}{2}}\left(\frac{1_x}{2},\frac{1_t}{2}\right)=z^*_{\frac{1}{2}}\left(0_x,\frac{1_t}{2}\right)$ (3.20)

It is shown from the above discussion that the time and space positions of the

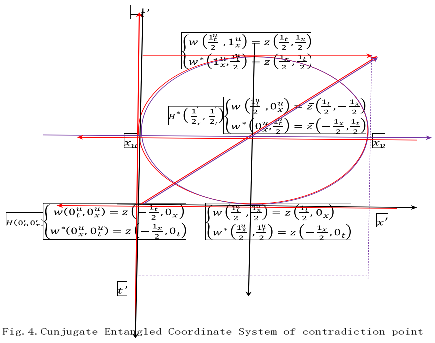


Fig. 4. Cunjugate Entangled Coordinate System of contradiction point

contradiction point $z_{\frac{1}{2}}$ can be coordinated by two coordinate (3.9) and (3.20) in two complex coordinate system, respectively.

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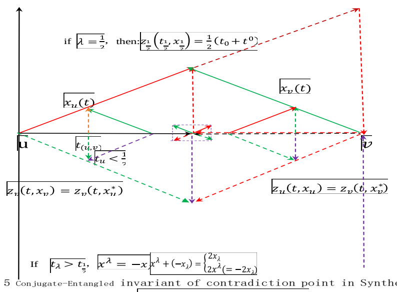

Fig. 5 Conjugate-Entangled invariant of contradiction point in Synthesis of complex Coordinate $= Z\otimes Z^* = (T\times X)\otimes(X\times T)$

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