Relative differential equations from water treatment Leukocytes with self-operating computer

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Article

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Relative differential equations from water treatment Leukocytes with self-operating computer

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Abstract

Conventional differentiation has many problems, they are no-smoothness, singularity, and non-simultaneous.

The origin of those problems is:

1. Since the differentiation value of conventional differentiation has the infinitesimal real number (include the problem of direction), simultaneous equations are impossible (rotation, vibration, and instability). Moreover, it generates singularity.

2. The problem concerning the existence of minus, There is no apple of a minus piece.

A minus piece (a minus time and a minus space) does not exist in the macro world, although it is able to exist in the world of the uncertainty principle. Therefore, don't use the number of minuses absolutely. It is defined as an absolute arithmetic. Relatively, the number of minuses should be used. It is defined as a relative arithmetic (operation).

In this study, relative differential equation (RDE) by Zai Pair which element-ized Nature World solves those problems. Concretely, RDE is able to obtain <u>smoothness</u> by Str Zai, obtain <u>the solution</u> from the singularity by Zai Pair, obtain Kyoku <u>without the infinitesimal real number</u> by Zai Pair and obtain independent from the <u>conventional absolute coordinate system</u>. Moreover, the RDE has self-operating computing, the RDE self-operating computer (SOC) is not model, and the RDE SOC is solution itself and the graph itself. In an example, inflammation itself is RDE SOC itself.

Intro

Conventional differentiation was convergence differential equation (CDE) has problems which is lacking the smoothness [1], lacking of the simultaneous equations [2-6], having singularities [7-16] (by infinitesimal real number) and having direction problems [17-19] (by the absolute arithmetic).

In this study, relative differential equation (RDE) by Zai Pair which element-ized Nature World solves those problems. Concretely, RDE have advantages [20, 21], that is able to obtain smoothness by Str Zai, obtain the solution from the singularity by Zai Pair, obtain Kyoku without <u>the infinitesimal real number</u> by Zai Pair and obtain independent from the conventional coordinate system.

The background to the work Branch point at Newton era : In this paper, I have proposed real mathematics [20], which consists of primitive operator (Zai, Kyoku, Str, etc). The real mathematics has a big branch point at Newton era [17] (Newton wrote, "in the direction of the right line in ~" in Principia. It is branch point term.), and the history had the big branch point during the period. [22-24]. Newton chose the real apple, but other Human beings chose the apple of the minus piece. It was selection of Imaginary mathematics. However, the real mathematics equivalent to Nature should be used for the mathematics of Natural Science.

Methods and Definitions relative differential equation (RDE) Basic model (detail is ref. **20** include supplementary), N is a variable of observation object, N_1 and N_2 is the number of observation object (condition) 1 and 2, time Po is τ, phase Po is m, it is phase Potential. γ is the coefficient of solution. Pure Element Number is pEN=1[20]. Kyoku is,

$$\frac{\begin{array}{c} K \\ |\,\mathrm{N} \\ \tau_n \end{array}}{\begin{array}{c} Z \\ | \\ \tau_n \end{array}} = \frac{\begin{array}{c} K \\ |\,\mathrm{N}_\tau \\ n \end{array}}{\begin{array}{c} Z \\ |\,\tau \\ n \end{array}} = \frac{{}_{r}d_{\tau_n}N}{{}_{r}d_{\tau_n}} = \frac{{}_{r}d_{n}N_{\tau}}{{}_{r}d_{n}\tau} = \frac{{}_{r}dN_{\tau_n}}{{}_{r}d\tau_n}$$

C is condition, the each condition as the following. (with self-operating computer: SOC [20])

C1 and C2 from C3 [20, 21]

Condition 1(C1) (Existence 1)

$$\frac{{}_{r}dN_{\tau_n}}{{}_{r}d\tau_n} = \frac{{}_{n-m}\triangle_{n}\, N_{2\tau}}{{}_{n-m}\triangle_{n}\, \tau} - \frac{{}_{n}\triangle_{n+m} N_{1\tau}}{{}_{n}\triangle_{n+m}\tau} = \frac{{}_{n+S_1m}\triangle_{n}\, N_{2\tau}}{{}_{n+S_1m}\triangle_{n}\, \tau} - \frac{{}_{n}\triangle_{n+S_2m} N_{1\tau}}{{}_{n}\triangle_{n+S_2m}\tau}$$

Condition 2(C2) (Existence 2)

$$\frac{{}_{r}dN_{\tau_n}}{{}_{r}d\tau_n} = -\frac{{}_{n-m}\triangle_{n}\, N_{2\tau}}{{}_{n-m}\triangle_{n}\, \tau} + \frac{{}_{n}\triangle_{n+m} N_{1\tau}}{{}_{n}\triangle_{n+m}\tau} = -\frac{{}_{n+S_1m}\triangle_{n}\, N_{2\tau}}{{}_{n+S_1m}\triangle_{n}\, \tau} + \frac{{}_{n}\triangle_{n+S_2m} N_{1\tau}}{{}_{n}\triangle_{n+S_2m}\tau}$$

C3 and C4 [20, 21]

Condition 3(C3): $$\frac{{}_{r}d_{\tau_n}N}{{}_{r}d_{\tau_n}} = +\frac{{}_{n-m}\triangle_{n}\, N_{2\tau}}{{}_{n-m}\triangle_{n}\, \tau} + \frac{{}_{n}\triangle_{n+m} N_{1\tau}}{{}_{n}\triangle_{n+m}\tau} = +\frac{{}_{n-m}\triangle_{n}\, N_{L\tau}}{{}_{n-m}\triangle_{n}\, \tau} + \frac{{}_{n}\triangle_{n+m} N_{R\tau}}{{}_{n}\triangle_{n+m}\tau}$$

$$= +\frac{{}_{n+S_1m}\triangle_{n}\, N_{2\tau}}{{}_{n+S_1m}\triangle_{n}\, \tau} + \frac{{}_{n}\triangle_{n+S_2m} N_{1\tau}}{{}_{n}\triangle_{n+S_2m}\tau}$$

Condition 4(C4): $$\frac{{}_{r}dN_{\tau_n}}{{}_{r}d\tau_n} = +\frac{{}_{n-m}\triangle_{n}\, N_{2\tau}}{{}_{n-m}\triangle_{n}\, \tau} + \frac{{}_{n}\triangle_{n+m} N_{1\tau}}{{}_{n}\triangle_{n+m}\tau}$$

$$= +\frac{{}_{n-S_2m}\triangle_{n}\, N_{2\tau}}{{}_{n-S_2m}\triangle_{n}\, \tau} + \frac{{}_{n}\triangle_{n-S_1m} N_{1\tau}}{{}_{n}\triangle_{n-S_1m}\tau}$$

C4 special notation of a different kind ${}_{1}N_{\tau}$ and ${}_{2}N_{\tau}$ is different kind (1 and 2).

$$\frac{{}_{r}dN_{\tau_n}}{{}_{r}d\tau_n} = +\frac{{}_{n-m}\triangle_{n}\ {}_{2}N_{\tau}}{{}_{n-m}\triangle_{n}\,\tau} + \frac{{}_{n}\triangle_{n+m}\ {}_{1}N_{\tau}}{{}_{n}\triangle_{n+m}\tau} = +\frac{{}_{n-S_2m}\triangle_{n}\ {}_{2}N_{\tau}}{{}_{n-S_2m}\triangle_{n}\,\tau} + \frac{{}_{n}\triangle_{n-S_1m}\ {}_{1}N_{\tau}}{{}_{n}\triangle_{n-S_1m}\tau}$$

Fig1 and Fig2 are the conceptual figure of C3 and C4. The examples of application are the ref 20 and the ref 21.

C5 to C7 are (Supplementary S1 equations)

Phase abbreviation

$$\triangle \ or \ \triangle$$

Calculation of τ

$$\tau_{n+S_1m} = \tau\cdot(n+S_1m)\,,\qquad \tau_{n+S_2m} = \tau\cdot(n+S_2m),$$

$$\tau_{n-S_1m} = \tau\cdot(n-S_1m)\,,\qquad \tau_{n-S_2m} = \tau\cdot(n-S_2m),$$

Primitive condition is

$$\text{Condition 0(C0)(primitive RDE):}\qquad | = {}_{n-?m}\Delta_{n} + {}_{n}\Delta_{n-?m}$$

$S_1=Str_1=-1$, $S_2=Str_2=+1$ [20] As for n and m, phase (value). The n indicates a origin (Kyoku |). t;t toki, τ;τtoki, indicates the time of τ. The n, m, and l indicate a phase (value) ($n\geqq0, m\geqq0, l\geqq0$). t_a is at the time of the phase a, t_n is at the time of the phase n, t_{n+m} is at the time of $\tau_n=t_n$ phase n+m.

In the above-mentioned example, the numerator and the denominator is both Zai.

As other examples, (N as pure Number, N with Inner Kyoku, Various Functions)

γ is, (C1, C2, C3),

$$\frac{{}_{r}dN_{\tau_n}}{{}_{r}d\tau_n} = \frac{{}_{r}d_{n}N_{\tau}}{{}_{r}d_{n}\tau} = \gamma N_{\tau_n} = \left(\frac{dN}{d\tau} = \gamma N\right)$$

Therefore,

$$+\frac{{}_{n+S_1m}\triangle_{n}\,N_{2_\tau}}{{}_{n+S_1m}\triangle_{n}\,\tau} + \frac{{}_{n}\triangle_{n+S_2m}N_{1_\tau}}{{}_{n}\triangle_{n+S_2m}\tau} = \gamma\times N$$

$$\gamma = \left(+\frac{{}_{n+S_1m}\triangle_{n}\,N_{2_\tau}}{{}_{n+S_1m}\triangle_{n}\,\tau} + \frac{{}_{n}\triangle_{n+S_2m}N_{1_\tau}}{{}_{n}\triangle_{n+S_2m}\tau}\right)\frac{1}{N} \ \underset{\text{Distributing}}{\overset{\text{Bundling}}{\overset{\rightarrow}{\underset{\leftarrow}{=}}}}\ \left(+{}_{n+S_1m}\triangle_{n}\,\frac{N_{2_\tau}}{\tau} + {}_{n}\triangle_{n+S_2m}\frac{N_{1_\tau}}{\tau}\right)\frac{1}{N} = \gamma$$

N is, (The following | | is relative absolute value operator: RAO)

$$N = \left(\left|{}_{n+S_1m}\triangle_{n}\,N_{2_\tau}\right| + \left|{}_{n}\triangle_{n+S_2m}N_{1_\tau}\right|\right)\cdot 1/2$$

(RAO and conventional absolute-value operator (AVO)is Supplementary S2 operators.)

In the case of m=1

$$\gamma = \left(\frac{{}_{n-m}\triangle_{n}\, N_{2_\tau} + {}_{n}\triangle_{n+m} N_{1_\tau}}{\left|{}_{n-m}\triangle_{n}\, N_{2_\tau}\right| + \left|{}_{n}\triangle_{n+m} N_{1_\tau}\right|} \right) \frac{2}{\tau}$$

C4 is

$$\gamma = \left(\frac{{}_{n-S_2m}\triangle_{n}\ {}_{2}N_\tau}{{}_{n-S_2m}\triangle_{n}\ \tau} + \frac{{}_{n}\triangle_{n-S_1m} N\ {}_{1}N_\tau}{{}_{n}\triangle_{n-S_1m} \tau} \right) \frac{1}{\mathrm{N}} = |\gamma$$

$$\mathrm{N} = \left(\left|{}_{n-S_2m}\triangle_{n}\ {}_{2}N_\tau\right| + \left|{}_{n}\triangle_{n-S_1m}\ {}_{1}N_\tau\right| + \right) \cdot 1/2 = |\mathrm{N}$$

In the case of m=1

$$\gamma = \left({}_{n-m}\triangle_{n}\ {}_{2}N_\tau + {}_{n}\triangle_{n+m}\ {}_{1}N_\tau \right) \frac{1}{N \cdot \tau} = |\gamma,$$

$${}_{1}\gamma_{\tau_n} = \frac{\varepsilon_{21} \cdot {}_{n-1}\triangle_{n}\ {}_{2}N_\tau + {}_{n}\triangle_{n+1}\ {}_{1}N_\tau}{\left|\varepsilon_{21} \cdot {}_{n-1}\triangle_{n}\ {}_{2}N_\tau\right| + \left|{}_{n}\triangle_{n+1}\ {}_{1}N_\tau\right|} \cdot \frac{2}{\tau}, \quad {}_{2}\gamma_{\tau_n} = \frac{{}_{n-1}\triangle_{n}\ {}_{2}N_\tau + \varepsilon_{12} \cdot {}_{n}\triangle_{n+1}\ {}_{1}N_\tau}{\left|{}_{n-1}\triangle_{n}\ {}_{2}N_\tau\right| + \left|\varepsilon_{12} \cdot {}_{n}\triangle_{n+1}\ {}_{1}N_\tau\right|} \cdot \frac{2}{\tau}$$

Existence 1 (${}_{1}$N) and existence 2 (${}_{2}$N), interference coefficient; ε_{12} is a predator coefficient and ε_{21} is a prey coefficient.

Result

Differentiation solution (gOOC and OOC) [20, 21]

How to determine the solution of RDE, and it is proved that RDE is differentiation.

In variable separation C3 RDE is, (About C2 and C1, [20])

$$+\frac{{}_{n+S_1m}\triangle_{n}\, N_{2_\tau}}{{}_{n+S_1m}\triangle_{n}\ \tau} + \frac{{}_{n}\triangle_{n+S_2m} N_{1_\tau}}{{}_{n}\triangle_{n+S_2m} \tau} = \gamma \times \mathrm{N}$$

Therefore (Bundling [20] and Distributing [20]) (The right equation is equivalent to Leukocyte Cluster [20].),

$$\left(+ \frac{{}_{\mathrm{n+S_1m}}\triangle_{\mathrm{n}}\, N_{2_\tau}}{{}_{\mathrm{n+S_1m}}\triangle_{\mathrm{n}}\, \tau} + \frac{{}_{\mathrm{n}}\triangle_{\mathrm{n+S_2m}} N_{1_\tau}}{{}_{\mathrm{n}}\triangle_{\mathrm{n+S_2m}} \tau} \right) \times \frac{1}{\mathrm{N}} \underset{\text{Distributing}}{\overset{\text{Bundling}}{\underset{\leftarrow}{\overset{\rightarrow}{=}}}} \left(+_{\mathrm{n+S_1m}}\triangle_{\mathrm{n}}\, \frac{N_{2_\tau}}{\tau} + {}_{\mathrm{n}}\triangle_{\mathrm{n+S_2m}} \frac{N_{1_\tau}}{\tau} \right) \times \frac{1}{\mathrm{N}} = \gamma$$

Moving τ term to the right-hand side (RHS), (in C1,C2, and C3)

$$\underset{\mathrm{n}}{\tfrac{1}{\mathrm{N}}} \times \left(\overset{C1}{\underset{\mathrm{n}}{\triangle}} N_{2_\tau} - \overset{C1}{\underset{\mathrm{n+1}}{\triangle}} N_{1_\tau} \right) = \gamma \cdot \tau,\ \ \underset{\mathrm{n}}{\tfrac{1}{\mathrm{N}}} \times \left(- \overset{C2}{\underset{\mathrm{n-1}}{\triangle}} N_{2_\tau} + \overset{C2}{\underset{\mathrm{n}}{\triangle}} N_{1_\tau} \right) = \gamma \cdot \tau,\ \ \underset{\mathrm{n}}{\tfrac{1}{\mathrm{N}}} \times \left(\overset{C3}{\underset{\mathrm{n}}{\triangle}} N_{2_\tau} + \overset{C3}{\underset{\mathrm{n}}{\triangle}} N_{1_\tau} \right) = \gamma \cdot \tau$$

The both sides are done by quadrature by parts (QBP), (The character C was abbreviated if it became long.)

$$\lim_{h\to\infty} \sum_{j=1}^{h} \frac{1}{\mathrm{N}_j} \times \frac{\underset{\mathrm{n}}{\triangle} N_{2_\tau} - \underset{\mathrm{n+1}}{\triangle} N_{1_\tau}}{h} = \gamma \cdot \lim_{h\to\infty} \sum_{j=1}^{h} 1_j \times \left(\frac{\tau}{h}\right)$$

$$\lim_{h\to\infty} \sum_{j=1}^{h} \frac{1}{\mathrm{N}_j} \times \frac{-\underset{\mathrm{n\text{-}1}}{\triangle} N_{2_\tau} + \underset{\mathrm{n}}{\triangle} N_{1_\tau}}{h} = \gamma \cdot \lim_{h\to\infty} \sum_{j=1}^{h} 1_j \times \left(\frac{\tau}{h}\right)$$

$$\lim_{h\to\infty} \sum_{j=1}^{h} \frac{1}{\mathrm{N}_j} \times \frac{\underset{\mathrm{n}}{\triangle} N_{2_\tau} + \underset{\mathrm{n}}{\triangle} N_{1_\tau}}{h} = \gamma \cdot \lim_{h\to\infty} \sum_{j=1}^{h} 1_j \times \left(\frac{\tau}{h}\right)$$

'×' (and green bar) is orthogonal multiplication. '·' is parallel multiplication. They are definite integration.

RHS is, (RHS is integrating for 1.)

$$\lim_{h\to\infty} \sum_{j=1}^{h} 1_j \times \left(\gamma \cdot \frac{\tau}{h}\right) = \lim_{h\to\infty} \sum_{j=1}^{h} \frac{1_j}{h} \times (\gamma \cdot \tau) = \gamma\tau, \qquad \lim_{h\to\infty} \sum_{j=1}^{h} \frac{1_j}{h} = \lim_{h\to\infty} \frac{h}{h} = 1, \left(\sum_{j=1}^{h} 1_j = 1 \cdot h \right)$$

Since LHS is the QBP for integration with interval, therefore,

$$\lim_{h\to\infty} \sum_{j=1}^{h} \frac{1}{\mathrm{N}_j} \times \frac{\triangle N_{2_\tau} - \triangle N_{1_\tau}}{h} = \int_{\triangle N_{1_\tau}}^{\triangle N_{2_\tau}} \frac{1}{N}\ {}_c dN = \int_{\triangle N_{1_\tau}}^{\triangle N_{2_\tau}} \frac{1}{N} dN = \gamma\tau$$

$$\lim_{h\to\infty} \sum_{j=1}^{h} \frac{1}{\mathrm{N}_j} \times \frac{-\triangle N_{2_\tau} + \triangle N_{1_\tau}}{h} = \int_{\triangle N_{2_\tau}}^{\triangle N_{1_\tau}} \frac{1}{N}\ {}_c dN = \int_{\triangle N_{2_\tau}}^{\triangle N_{1_\tau}} \frac{1}{N} dN = \gamma\tau$$

$$\lim_{h\to\infty} \sum_{j=1}^{h} \frac{1}{\mathrm{N}_j} \times \frac{\triangle N_{2_\tau} + \triangle N_{1_\tau}}{h} = \int_{-\triangle N_{1_\tau}}^{+\triangle N_{2_\tau}} \frac{1}{N}\ {}_c dN = \int_{-\triangle N_{2_\tau}}^{+\triangle N_{1_\tau}} \frac{1}{N} dN = \gamma\tau$$

Supplementary S3 Quadrature by parts (QBP) and definite integration, Supplementary S4 variable separation,

The differential solution is, (integration constant is abbreviated. N_0 and N_{00} are initial value.)

$$\log_e \mathrm{N} = \gamma\tau + \mathrm{N}_{00} \quad ,$$

Therefore,

$$\mathrm{N} = \mathrm{N}_0 \cdot \exp(\gamma\tau)$$

<u>They are proved that RDE is differentiation.</u> Furthermore, it is the answer same also by MathCad. Here, since both sides are limitation similarly, there is no change of View.

Discussion

1. Since RDE (leukocyte continuum [20]) expresses the solution itself, it is the SOC [20] which will develop thinking, wise and intelligence of people scientifically.

2. Above etc., relative differential equation (RDE) has advantages [20, 21], that can obtain smoothness by a Str operator, can obtain a solution from a conventional singularity by Zai Pair, and can obtain Kyoku by Zai.

3. The simultaneous equations are easy and stable, because RDE does not have an error of the infinitesimal real number [20, 21].

4. In an example of parts of RDE,

ΔN are N band of Zai, Δτ are τ band of Zai. (Δτ are also space band. Replacement of Δτ are possible in space. It is (x, y, z) which has the dimension of Length.) They are the diagrammatic charts of time and the number. It can be seen the space and the number, or the space and the time. We feel as the diagrammatic chart of a calculated result [20].

5. In another example of parts of RDE,

$\frac{\Delta N_{\tau_n}}{\Delta \tau_n}$ indicate that the number (dimensional space) overlaps time. It is τs.c. [20].

6. RDE is able to express the equation using uncertainty Zai in elementary particle level [20].

7. In Natural Science, RDE and primitive operators advance science greatly [20, 21].

Conclusion

1. RDE has relative minuses operation.

2. RDE has <u>smoothness</u> [20, 21].

3. RDE realizes SOC (self-operating computer) [20].

4. RDE does not have an error of the infinitesimal real number [20, 21].

5. RDE can acquire the Kyoku value as true 0 (without infinitesimal real number) [20, 21].

6. RDE has real coordinate system [20, 21].

7. A RDE with Kyoku conection has easy link to other RDE, simultaneously (RDE is able to do simultaneousness equations) [20, 21].

8. The partial differential equations by C3 and C4 are also stable, because it does not have the infinitesimal real number [20, 21].

9. RDE does not have singularity.

10. RDE can express fluctuation velocity.

11. Basic applications are [20, 21]**,**

Y. Nonomura, (2019) Measurement and self-operating computer of the leukocyte continuum as a fixed space–time continuum in inflammation, *bioRxiv,* http://biorxiv.org/cgi/content/short/543611v2, [**Ref 20]** and

Y. Nonomura (2021) Characterization and eradication of the high concentration infection source of oral segment of *Candida* by infection examination diagnosis system. *Research Square.* https://www.researchsquare.com/article/rs-150782/v2. [**Ref 21]**

DOI:**10.21203/rs.3.rs-150782/v2**. **Download PDF**

References

Lacking the smoothness,

1 Fefferman, C.L. (2000) Existence and smoothness of the Navier–Stokes equation. Millennium Prize Problems, http://www.claymath.org/sites/default/files/navierstokes.pdf

Lacking of the simultaneous equations (prey-predator etc.),

2 Nicholas F. Britton. Essential Mathematical Biology, (*Springer-Verlag,* London,U.K. 2010), pp.55-59

3 Hawkins, A., Cornell, H.V. (1999) Theoretical Approaches to Biological Control. Cambridge University Press: Cambridge, UK, pp. 5–14.

4 Krainov, V.P. (2002). Selected Mathematical Methods in Theoretical Physics. Taylor & Francis: London and New York, pp. 165–176.

5 Teramoto, E., et al. (2009) Suuri Seitaigaku. Asakura Shoten: Tokyo, pp. 76–116.

6 Thornley, J.H.M., France, J. (2007). Mathematical Models in Agriculture, 2nd edition. CABI: Wallingford, UK, pp. 227–228.

The singularities (NSE and Black hole etc.), (including limiting value with the infinitesimal real number)

NSE Solution and singularity

7 Scheffer, V. Partial regularity of solutions to the Navier-Stokes equations. Pacific J. Math. 66, 535552 (1976). https://projecteuclid.org/euclid.pjm/1102818026

8 Caffarelli, L., Kohn, R. & Nirenberg, L. Partial regularity of suitable weak solutions of the Navier-Stokes equations. Comm. Pure Appl. Math. 35, 771831 (1982). https://onlinelibrary.wiley.com/doi/abs/10.1002/cpa.3160350604

9 Guermond, J. L., Pasquetti, R. & Popov, B. From suitable weak solutions to entropy viscosity. J. Sci. Comp. 49, 35–50 (2011). https://www.math.tamu.edu/~guermond/PUBLICATIONS/guermond_pasquetti_J_SCI_COMPUT_2011.pdf

Singularity and critical points

10 Kuzzay, D. et al. New criteria to detect singularities in experimental incompressible flows. Nonlinearities. preprint arXiv:1601.03922 (2016). https://arxiv.org/abs/1601.03922

11 Perry, A. E. & Fairlie, B. D. Critical points in flow patterns. Adv. Geophys. 18B, 299–315 (1974).

Universe, Black hole, Metric and singularity

12 John D. Barrow, Action principles in nature, Nature **331**, 31–34, pC1 Kyoku https://www.nature.com/articles/331031a0

13 JOHN STACHEL, Behaviour of Weyl–Levi Civita Coordinates for a Class of Solutions approximating the Schwarzschild Metric, Nature **219**, 1346–1347, (1968), https://www.nature.com/articles/2191346a0

14 W. DAVIDSON, Operational Identification of Schwarzschild Co-ordinates, Nature **216**, 771–772, (1967), https://www.nature.com/articles/216771a0

15 JAMES M. BARDEEN, Kerr metric Black Holes, Nature **226**, 64–65, (1970) https://www.nature.com/articles/226064a0

16 W. DAVIDSON, Gravity-induced electric polarisation near the Schwarzschild limit, Nature 249, 431, (1974), https://www.nature.com/articles/249431a0

Direction problems from Newton's equation to Navier-Stokes's equation (NSE) Singularity (including having a wrong calculation result by a conventional coordinate system)

17 Isacc Newton, the Principia. (Prometheus Books, New York, 1995) (Saw, E.-W., et al., 2016)

18 E.-W. Saw, et. al, Experimental characterization of extreme events of inertial dissipation in a turbulent swirling flow, nature communications | 7:12466 | DOI; 10.1038/ncomms12466 | https://www.nature.com/articles/ncomms12466

19 Katia Moskvitch, Fiendish million-dollar proof eludes mathematicians, Nature News, http://www.nature.com/news/fiendish-million-dollar-proof-eludes-mathematicians-1.15659

Basic application,

20 Y. Nonomura, Measurement and self-operating computer of the leukocyte continuum as a fixed space–time continuum in inflammation, *bioRxiv,* http://biorxiv.org/cgi/content/short/543611v2

21. Y. Nonomura (2021) Characterization and eradication of the high concentration infection source of oral segment of *Candida* by infection examination diagnosis system. *Research Square.* https://www.researchsquare.com/article/rs-150782/v2. DOI:**10.21203/rs.3.rs-150782/v2**. **Download PDF**

Prior works as branch point

22 Rene Descartes, La Geometrie, A Hermann, Ed. (Gutenberg Ebook, Aug. 23, 2008)

23 Isacc Newton, Enumeration of lines of the third order, Cambridge University Library, 1642-1727, 0-160, (especially page 156), (http://cudl.lib.cam.ac.uk/collections/newton)

24 Leibniz,Gottfried Wilhelm, Nova methodus pro maximis et minimis, itemque tangentibus,…,& singulare pro illis calculi genus, 1684, 467-473, Mathematical Treasure: Leibniz Papers on Calculus, F. J. Swetz, (The Pennsylvania State University),
(http://www.maa.org/book/export/html/641727)

Millennium problems

25 Cook, S. (2000) The P versus NP problem. Millennium Prize Problems, http://www.claymath.org/sites/default/files/pvsnp.pdf (access October 25, 2018).

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Conflicts of interest

The author declares no conflicts of interest, except for the patents and TM.

Japanese Pat.

1) 2021-66161, Arithmetic unit, April 8,2021, in Japan, Riken Co., Ltd.,
2) 2020-41422, Arithmetic unit, March 10, 2020, in Japan, Riken Co., Ltd.,
3) Japanese Pat No6555573, 2019.8.7, Computer arithmetic unit, Riken Co., Ltd.,
4) Japanese Pat No6555574, 2019.8.7, Computer arithmetic unit, Riken Co., Ltd.,
5) Japanese Pat No6796295, 2020.11.18, Str Arithmetic unit, Riken Co., Ltd.,
6) Japanese Pat No6800460, 2020.11.27, Arithmetic unit, Riken Co., Ltd.,
7) Trademark 5510605, July 27, 2012, MicroDent Co., Ltd.,

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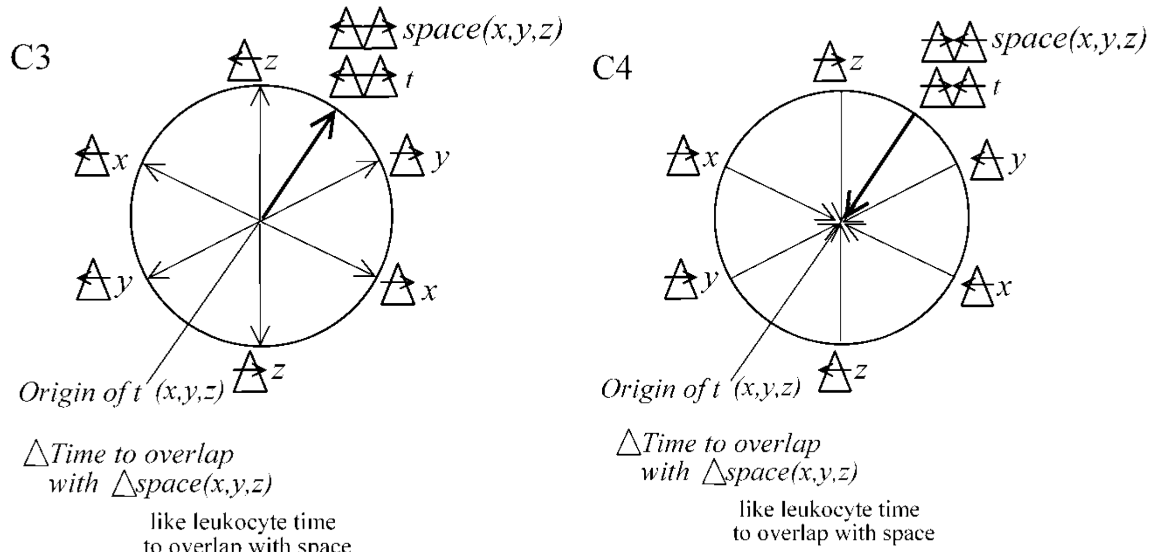
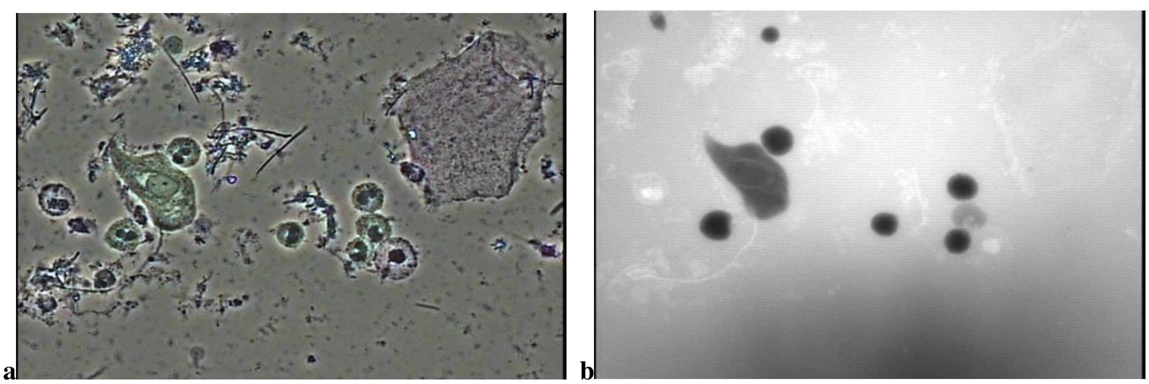


a **b**

Figure 1 the image of C3 and C4

Figure 2



a **b**

Figure 2 Water Solution Treatment Leukocyte (WSTL) image (include StrLC in see ref 20)

Leukocyte (**a**, **b**) diameter is about 15μm.

a, phase contrast image, **b,** τ time image, it is fluorescence image. And, Time Space is overlapped image.

Figures

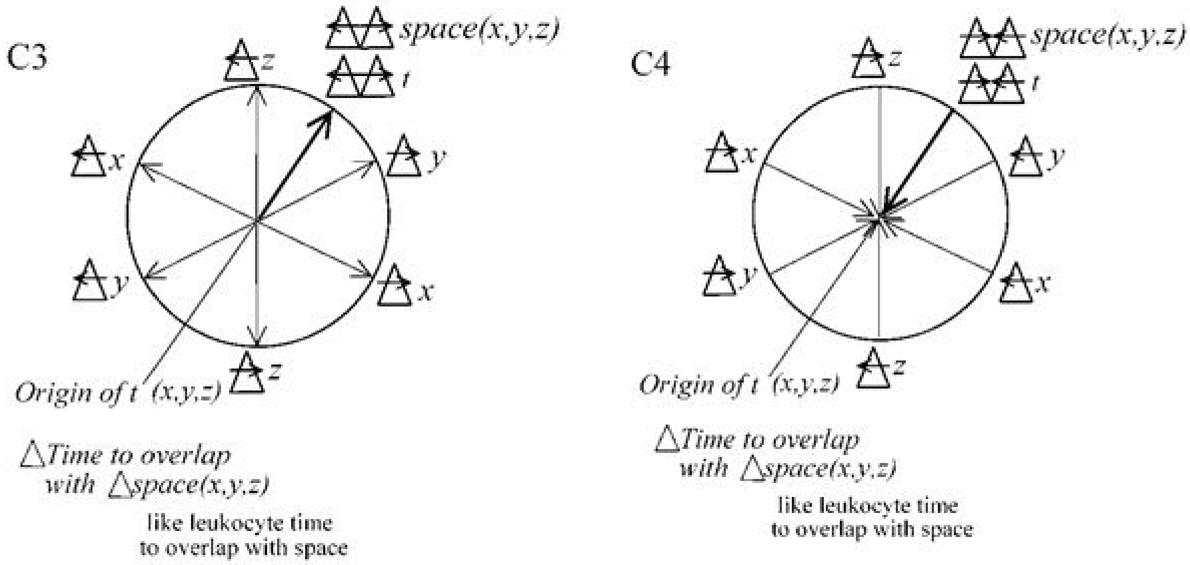


Figure 1

The image of C3 and C4

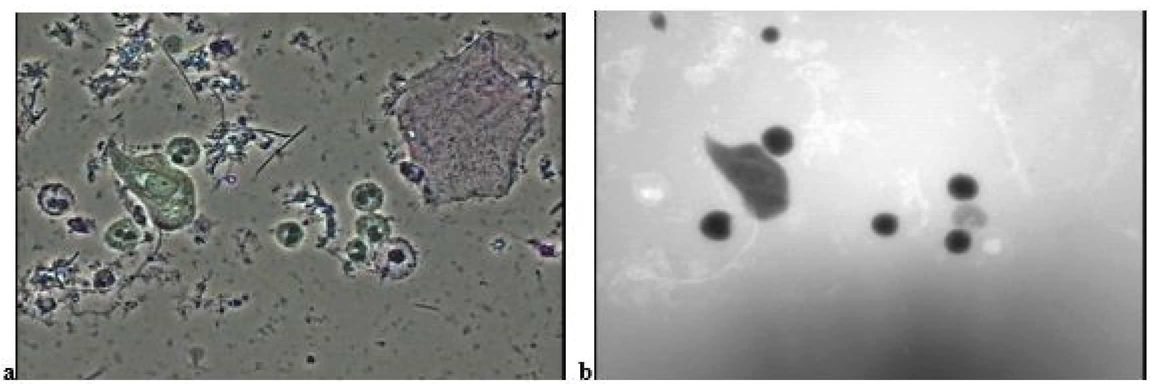


Figure 2

Water Solution Treatment Leukocyte (WSTL) image (include StrLC in see ref 20) Leukocyte (a, b) diameter is about 15μm. a, phase contrast image, b, τ time image, it is fluorescence image. And, Time Space is overlapped image.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryMaterialsfrom24W7WC5toC7.docx