The Symmetry of N-domain、Prime Conjectures and Unified Theory

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Abstract In this paper, we discuss the symmetry of N-domain and we find that using the symmetry characters of Natural Numbers we can give proofs of the Prime Conjectures: Twins Prime Conjecture、Goldbach Conjecture and Reimann Hypothesis. and only give this domain the unit h (Plank constant), C (the velocity of light) and t (time), when considering the intensity of field 1/aF as the curvature of the Quantum Time-Space with energy, then we get a Unified theory.

Keywords N domain Prime Conjectures

We have

\[ N \sim \left( 0, 1, 2, 3, 4, \ldots \right) \text{ all the natural numbers} \]
\[ n \sim \left( 1, 2, 3, 4, \ldots \right) \text{ all the natural numbers excepted 0} \]
\[ P \sim \left( 2, 3, 5, 7, \ldots \right) \text{ all the prime numbers} \]
\[ p \sim \left( 3, 5, 7, \ldots \right) \text{ all the odd prime numbers} \]

We notice that

\[ N \sim \left( 0, n \right) \]
\[ P \sim \left( 2, p \right) \]

Fig.1. N domain as 2n×2n
We can define a N domain as $2n \times 2n$ with the center point of this square is 

$$p_0 = <n, n> \text{ and } n \in p$$

show as on figure 1.
We have a square with the vertexes are

$$0, <0, 2n>, <2n, 2n>, 2n$$

The area of this domain is $S_{2n} = 2n \times 2n$

And we can construct a N, n, P coordinate system:
The N number axis have 4 points:

$$0, 1, 2, 2n$$

The n number axis have five points:

$$p_0 - 2, p_0 - 1, p_0, p_0 + 1, p_0 + 2$$

And at the P number axis:
Prime number 2 is the point 2.
All the odd prime number can be indicated as:

$$p = n \text{ and } n \in p$$

we can get a square with a center point $p_0$ and the vertexes are

$$p_0 - 2, p, p_0 + 2, 2$$

The area of this domain $S_{p_0} = 2 \times (2 + 2)$
we can also get a square with a center point $p_0$ and the vertexes are

$$p_0 - 1, p_2, p_0 + 1, p1 \quad p1, p2 \in p$$

The area of this domain $S_0 = 2 \times 2$

*And we have a projection vertical to $S_0$, $p_0$ is the point at infinity and show as on figure 2.*
We have

\[ p_0 \rightarrow n \]
\[ p_1 \rightarrow n - 1 \]
\[ p_2 \rightarrow n + 1 \]
\[ p_2 - p_1 = < n + 1 > - < n - 1 > = 2 \]

Because we have infinite prime numbers. This mean that we have infinite twin primes in N domain. **This is the proof of Twin Primes Conjecture.**

\[ p_2 + p_1 = n + 1 + n - 1 = 2n \]

And \( n - 1 \geq 2 \) \( n \geq 3 \) So \( 2n \geq 6 \)

This mean that every even number bigger than six can be divided into two odd prime numbers in N domain. **This is the proof of Goldbach conjecture.**

We notice the squares with the vertexes

\[ 0. \ p_0 - 2. \ p_0. \ 2 \]

And

\[ p_0. \ p. \ < 2n, 2n > . \ p_0 + 2 \]

And we can get points 1/2, ZP1, ZP2, ZP3, and ZP4 show as on figure 1.

![Graph showing the symmetry of zero-points on the N-P domain](image)

**Fig. 3. The symmetry of zero-points of on the N-P domain**

And we have a projection vertical to \( S_{2n} \), \( p_0 \) is **the point at infinity** show as on figure 2.

We find ZP1, ZP2, ZP3, ZP4 have a symmetry with \( p_0 - (n, n) \). Just as show on Fig. 2

\[ Zp1 = \frac{1}{2} + \frac{1}{3}(p0 - \frac{1}{2}) \]
\[ Zp2 = \frac{1}{2} + \frac{2}{3}(p0 - \frac{1}{2}) \]
\[ Z_p^3 = 2p_0 - \left[ \frac{1}{2} + \frac{2}{3}(p_0 - \frac{1}{2}) \right] = \frac{1}{2} + \frac{4}{3}(p_0 - \frac{1}{2}) \]

\[ Z_p^4 = 2p_0 - \left[ \frac{1}{2} + \frac{1}{3}(p_0 - \frac{1}{2}) \right] = \frac{1}{2} + \frac{5}{3}(p_0 - \frac{1}{2}) \]

Because

\[ \frac{1}{2} = (\frac{1}{2} + \frac{1}{2} \cdot i) \cdot (\frac{1}{2} - \frac{1}{2} \cdot i) \]

We can get circles with 1/2 and the intersections with the axis are: 
\( Zp1, Zp2, Zp3, Zp4 \)

**All of them on the symmetry of 1/2 points.**

We can get circles with \( p_0 \) and the intersections with the axis are: 
\( 1, Zp1, p_0, zp3, 2 \)

We can get circles with \( p_0 \in p \) and the intersections with the axis are
\( p_0 + 1/2, Zp2, p_0, Zp4, p_0 - 1/2 \)

Just show as the figure.3.

![Figure 4. Zero points with a symmetry of 1/2 point](image)

**Riemann Zeta-Function** is

\[ \xi (s) = \sum_{n=1}^{\infty} \frac{1}{n^s} = \prod_{1-p^s} \frac{1}{1-s} \quad (s = a + bi) \]

**Riemann Hypothesis**: all the Non-trivial zero-point of Zeta-Function \( Re(s) = \frac{1}{2} \).

In fact, we have

\[
\begin{bmatrix}
1 + i & 1 & 0 \\
0 & \frac{1}{2} & 1 \\
1 & 0 & 1 - i
\end{bmatrix}
\begin{bmatrix}
\frac{1}{2} & \frac{1}{2} & \cdots & n - \frac{1}{2} \\
\frac{1}{2} & \frac{1}{2} & \cdots & n - \frac{1}{2} \\
\frac{1}{2} & \frac{1}{2} & \cdots & n - \frac{1}{2} \\
\frac{1}{2} & \frac{1}{2} & \cdots & n - \frac{1}{2}
\end{bmatrix}
= 0
\]
The tr(A)=1/2*N
We think this is the Proof of Riemann Hypothesis.

In fact, we have

$$1 + \frac{e^{ip\pi} - e^{i2n\pi}}{\sum \frac{1}{2^N}} = 0$$

$$N \sim \left(0, 1, 2, 3, 4, \ldots \right) \text{ all the natural numbers.}$$

$$p \sim \left(3, 5, 7, \ldots \right) \text{ all the odd prime numbers.}$$

this equation gives a structure of all N and P and a 1/2 fixed point.

$$1/2, Zp1, Zp2 \text{ quarter line p0-0 and}$$

$$p0 - Zp2 = Zp3 - p0$$

$$p0 - Zp1 = Zp4 - p0$$

we can construct a Time-Space with energy coordinate system just give:

horizontal ordinate $$t - \langle \frac{c}{\alpha_F} \rangle$$ is the time (s)

longitudinal coordinates $$<hc>$$, h is plank constant (J.s) c is the velocity of light (m/s)

Fig.5. Time-Space with Energy

In Fig.2, And we notice that We have a square with the vertexes are

$$0, P0+2, P0, P0-2$$

The area of this domain is $$S_{2n} = 2n \times 2n$$ , this we can define this as graviton field.

The rectangle with a center point 2 and the vertexes are

$$ZP1, ZP3, P0-1/2, P0+1/2$$
The area of this domain $S_{EM}$ we can define this as **electromagnetic field**

The square with a center point 2 and the vertexes are

$$Zp^2 \cdot Zp^4 \cdot p^0 - 1 \cdot p^0 + 1$$

The area of this domain we can define this as **strong interaction field**

The line with a center point 2 and the vertexes are

$$p^0 + 1 \cdot p^0 - 1$$

we can define this as **weak-interaction**

**and**

$$S_0 \sim hC$$

$$\frac{1}{a_F} \sim \frac{h}{C}$$

$1/a_F$ can be considered as the curvature of the Space-Time with Energy $S_{2n} = 2n \times 2n$. We should call it gravitation.