$L^{1/2}{}_{(0\ 1/2\ 1)}$ Entropy Space and Prime Conjectures

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Abstract In this paper, we get a characteristic equation of $L^{1/2}$ space and we find that using this equation we can give proofs of the Prime Conjectures.

Keywords $L^{1/2}{}_{(0\ 1/2\ 1)}$ Space Prime Conjectures

$L^{1/2}{}_{(0,1/2\ 1)}$ Space coordinate system

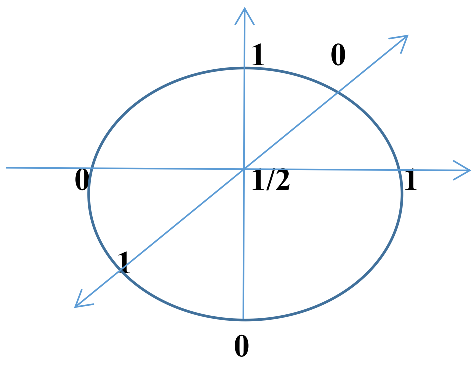

Figure.1. A $L^{1/2}{}_{(0\ 1/2\ 1)}$ Space

$$\tau \in N[0 \quad {}^{1}\!/_{2} \quad 1] \; N \bmod(2N)$$

$$T \in (e^{2\pi Ni} = 1, e = \lim_{n\to\infty}(1+\frac{1}{N})^{N})$$

$$t \in \left\langle \frac{e^{i2\pi} + e^{i\pi}}{2} = 0, \frac{e^{i2\pi} - e^{i\pi}}{2} = 1 \right\rangle$$

$$<T>_{[0,1)} = <\tau>_{[0,1/2,1]} + <t>_{[0,1]}$$

$$LnT = N + \frac{1}{2\pi Ni}$$

$$1 + {}^{1}\!/_{N}(\frac{1}{2\pi Ni} - LnT) = 0$$

Because we have

$$\frac{e^{i2\pi}+e^{i\pi}}{2}=0,\ \frac{e^{i2\pi}-e^{i\pi}}{2}=1$$

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

$$\frac{e^{i2(n\pm1)\pi}+e^{i(p\pm2)\pi}}{2}=0,\quad \frac{e^{i2(n\pm1)\pi}-e^{i(p\pm2)\pi}}{2}=1$$

$$\frac{e^{i2*2n\pi}+e^{\frac{i2}{p}\pi}}{2}=1,\quad \frac{e^{i2*2n\pi}-e^{\frac{i2}{p}\pi}}{2}=0$$

$$\frac{e^{i(2n+1)\pi}+e^{ip\pi}}{2}=-1,\quad \frac{e^{i(2n+1)\pi}-e^{ip\pi}}{2}=1$$

We Can get the character of this Domain is N, and Because this domain is finite , so the character is also ~P.

So $N\sim P$

$$N\rightarrow\langle n-1,\ n,n+1,2n,2n+1\rangle\sim(p-2,\ p,\ p+2,2,0)$$

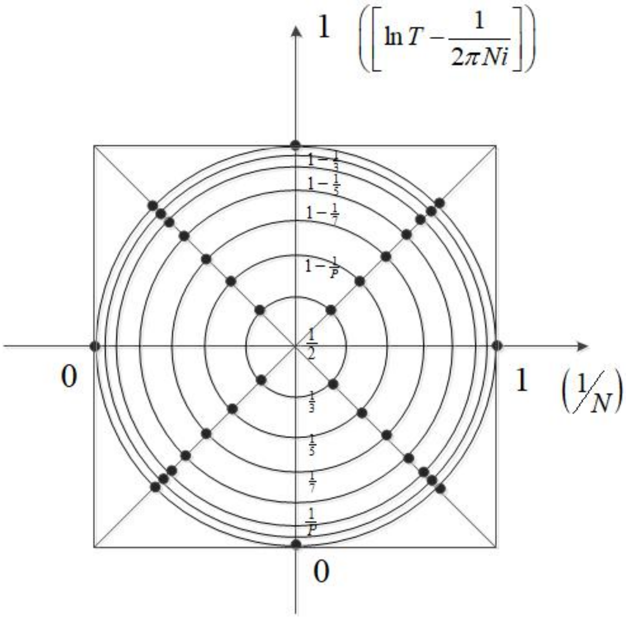

Fig.2 The P rings and the non-trivial zeros of zeta Functions in the1/ 2N domain

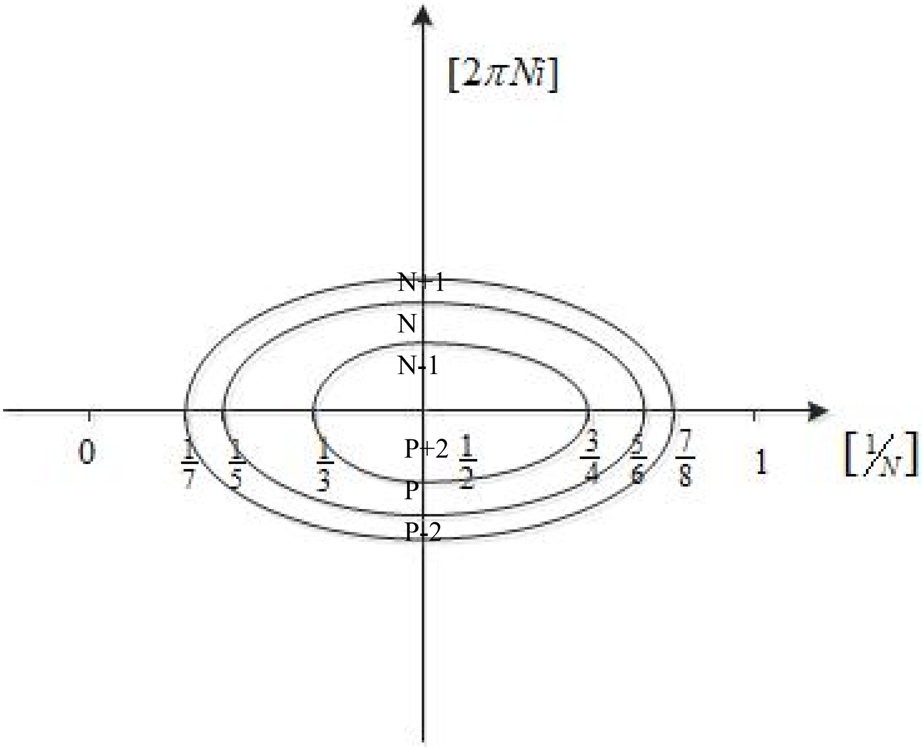

Fig.3 The zero points at the 1/N axis

1. The Proof of Riemann Hypothesis

$$\begin{bmatrix} 0\,1\,0 \\ 0\,\tfrac{1}{2}\,1 \\ 1\,0\,0 \end{bmatrix} \rightarrow \ln T = N + \frac{1}{2\pi Ni} \rightarrow \begin{bmatrix} \tfrac{1}{2} & \tfrac{1}{2}+\frac{1}{2\pi i} & \cdots\cdots\ \tfrac{1}{2}N+\frac{1}{4\pi Ni} \\ \tfrac{1}{2}-\frac{1}{2\pi i} & \tfrac{1}{2} & \cdots\cdots\cdots\cdots \\ \cdots\cdots\cdots\cdots & \tfrac{1}{2} & \cdots\cdots\cdots\cdots \\ \tfrac{1}{2}N-\frac{1}{4\pi Ni} & \cdots\cdots\cdots\cdots & \tfrac{1}{2} \end{bmatrix} \qquad (N \times N)$$

This is a Hermitian matrix, its Eigens value is all the non-trivial zeros of **Zeta Function.** The trace of matrix $t_r(A) = \tfrac{1}{2} \bullet N$. Riemann Hypothesis means that $\sum_N \mathrm{Re}(s) = \tfrac{1}{2} \bullet N$ **SO this is a Proof of Riemann Hypothesis!**

2. The proof of Twin Primes Conjecture

$$N \sim P$$

$$< n-1, n, n+1 > \sim (p-2,\ p,\ p+2)$$

This mean that we have infinite twin primes in N set.

3. The proof of Goldbach conjecture

$$N \sim P$$

$$< n-1, n, n+1 > \sim (p-2, p, p+2)$$

$$\begin{aligned}
2n &= n+1+n-1 \\
&= < n+1 > + < n-1 > \\
&= < p+2 > + < p-2 > \\
&= p_1 + p_2
\end{aligned}$$

4.A concise proof of Fermat' last Theorem

$$N \sim P$$

$$< n-1 \quad n \quad n+1 \quad 2n \quad 2n+1 >$$

$$< p-2 \quad p \quad p+2 \quad 2 \qquad 0 >$$

$$N < 1,2,3,4 > \sim P < 2,3,5,7 >$$

$$\begin{array}{lll}
0^1 + 2^1 = 2^1 & 2^2 + 0^2 = 2^2 & 2^3 + 0^3 = 2^3 \\
1^1 + 2^1 = 3^1 & 3^2 + 0^2 = 3^2 & 3^3 + 0^3 = 3^3 \\
2^1 + 3^1 = 5^1 & 3^2 + 4^2 = 5^2 & 5^3 + 0^3 = 5^3 \\
3^1 + 4^1 = 7^1 & 7^2 + 0^2 = 7^2 & 7^3 + 0^3 = 7^3
\end{array}$$

This means that there is no P ring at 1/(2n+1) points in 1/2-1/N -2πNi domain. This is equal to $X^n + Y^n = Z^n$ When n>2 has no integer solution.