A new method to find trivial zeros of Riemann hypothesis

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Abstract

The counterexample of the Riemann hypothesis causes a significant change in the image of the Riemann Zeta function, which can be distinguished using mathematical judgment equations. The counterexamples can be found through this equation.

Keywords: `Riemann hypothesis`, Riemann Zeta function, counterexample

1. Introduce

The Riemann hypothesis is favored by mathematicians, and a feasible method of falsification is to constantly search for counterexamples. Thirty trillion non trivial zeros found so far are all located on the critical line, with no counterexamples.Following the original method, it will be very difficult to find counterexamples. Therefore, a completely new method has been created, hoping to find counterexamples at a faster speed.Without establishing a new system of number theory, solving the Riemann hypothesis requires extremely high skill, which heavily relies on intuition in mathematics. Meanwhile, luck will also become a crucial component.

2. Mathematical Principles

Analytical number theory is a combination of trigonometric functions and polynomial symbols, which can be solved no matter how difficult it is. Therefore,the

Riemann hypothesis is not unsolvable. In the field of number theory, the mathematical community tends to seek a maximum number to overturn the conclusion. Whether the Riemann hypothesis or the Goldbach conjecture,it should be the solution.

- The most basic task of falsifying the Riemann hypothesis is computation. By making curve of $\mathrm{Re}(\xi) = 0$ and $\mathrm{Im}(\xi) = 0$,their intersection point can be found to obtain the zero point
- Any curve of $\mathrm{Re}(\xi) = 0$ and $\mathrm{Im}(\xi) = 0$ can only have a unique intersection point at Re(s)=1/2, or there may be two symmetric focal points about Re(s)=1/2
- If the non trivial zero point exists,Re (s)!= 1/2,then starting from the real number axis and moving towards positive infinity along Re (s)=1/2, the Im-Re curve at the non trivial zero point will rotate clockwise to counterclockwise, and vice versa
- The distribution of prime numbers is irregular, which inevitably leads to the existence of a very large number that makes the Riemann hypothesis untenable

3. Descriptive equation

According to the definition of the Riemann Zeta function, within the critical band

$$\zeta\left(\mathrm{s}\right) = \frac{1}{1-2^{1-\mathrm{s}}}\sum_{\mathrm{n}=1}^{\infty}\frac{\left(-1\right)^{\mathrm{n}+1}}{\mathrm{n}^{\mathrm{s}}} \tag{1}$$

$$= \frac{1}{1-2^{1-\mathrm{r}-\mathrm{it}}}\sum_{\mathrm{n}=1}^{\infty}\frac{\left(-1\right)^{\mathrm{n}+1}}{\mathrm{n}^{\mathrm{r}+\mathrm{it}}} \tag{2}$$

$$= \frac{1}{1-\left(2^{1-\mathrm{r}}\right)\left(2^{-\mathrm{it}}\right)} \sum_{\mathrm{n}=1}^{\infty} \frac{(-1)^{\mathrm{n}+1} \mathrm{n}^{-\mathrm{it}}}{\mathrm{n}^{\mathrm{r}}} \tag{3}$$

$$= \frac{1}{1-\left(2^{1-\mathrm{r}}\right)\left(\mathrm{e}^{\ln 2^{-\mathrm{it}}}\right)} \sum_{\mathrm{n}=1}^{\infty} \frac{(-1)^{\mathrm{n}+1} \mathrm{e}^{\ln \mathrm{n}^{-\mathrm{it}}}}{\mathrm{n}^{\mathrm{r}}} \tag{4}$$

$$= \frac{1}{1-\left(2^{1-\mathrm{r}}\right)\left(\mathrm{e}^{-i\mathrm{t}\cdot\ln 2}\right)} \sum_{\mathrm{n}=1}^{\infty} \frac{(-1)^{\mathrm{n}+1} \mathrm{e}^{-i\mathrm{t}\cdot\ln n}}{\mathrm{n}^{\mathrm{r}}} \tag{5}$$

$$= \frac{1}{1-\left(2^{1-\mathrm{r}}\right)\left[\cos\left(-\mathrm{t}\cdot\ln 2\right)+\mathrm{i}\sin\left(-\mathrm{t}\cdot\ln 2\right)\right]}\cdot$$

$$\sum_{\mathrm{n}=1}^{\infty} \frac{(-1)^{\mathrm{n}+1}\left[\cos\left(-\mathrm{t}\cdot\ln n\right)+\mathrm{i}\sin\left(-\mathrm{t}\cdot\ln n\right)\right]}{\mathrm{n}^{\mathrm{r}}} \tag{6}$$

$$= \frac{1}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]-i\left(2^{1-\mathrm{r}}\right)\sin\left(-\mathrm{t}\cdot\ln 2\right)}\cdot$$

$$\sum_{\mathrm{n}=1}^{\infty} \frac{(-1)^{\mathrm{n}+1}\left[\cos\left(-\mathrm{t}\cdot\ln n\right)+\mathrm{i}\sin\left(-\mathrm{t}\cdot\ln n\right)\right]}{\mathrm{n}^{\mathrm{r}}} \tag{7}$$

$$= \frac{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]+i\left(2^{1-\mathrm{r}}\right)\sin\left(-\mathrm{t}\cdot\ln 2\right)}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^2+\left[\left(2^{1-\mathrm{r}}\right)\sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^2}\cdot$$

$$\sum_{\mathrm{n}=1}^{\infty} \frac{(-1)^{\mathrm{n}+1}\left[\cos\left(-\mathrm{t}\cdot\ln n\right)+\mathrm{i}\sin\left(-\mathrm{t}\cdot\ln n\right)\right]}{\mathrm{n}^{\mathrm{r}}} \tag{8}$$

$$= \frac{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]\sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\cos(-\mathrm{t}\cdot\ln n)}{\mathrm{n}^{\mathrm{r}}}}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^2+\left[\left(2^{1-\mathrm{r}}\right)\sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^2}-$$

$$\frac{\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\sin(-\mathrm{t}\cdot\ln n)}{\mathrm{n}^{\mathrm{r}}}}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}+\left[\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}}+$$

$$i\frac{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]\sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\sin(-\mathrm{t}\cdot\ln n)}{\mathrm{n}^{\mathrm{r}}}}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}+\left[\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}}+$$

$$i\frac{\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\cos(-\mathrm{t}\cdot\ln n)}{\mathrm{n}^{\mathrm{r}}}}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}+\left[\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}} \tag{9}$$

Define

$$f(r,t)=\frac{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]\sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\cos(-\mathrm{t}\cdot\ln n)}{\mathrm{n}^{\mathrm{r}}}}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}+\left[\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}}-$$

$$\frac{\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\sin(-\mathrm{t}\cdot\ln n)}{\mathrm{n}^{\mathrm{r}}}}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}+\left[\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}} \tag{10}$$

$$g(r,t)=\frac{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]\sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\sin(-\mathrm{t}\cdot\ln n)}{\mathrm{n}^{\mathrm{r}}}}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}+\left[\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}}+$$

$$\frac{\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\cos(-\mathrm{t}\cdot\ln n)}{\mathrm{n}^{\mathrm{r}}}}{\left[1-\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}+\left[\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\right]^{2}} \tag{11}$$

Then

$$\zeta\left(\mathrm{s}\right)=f(r,t)+i\cdot g(r,t) \tag{12}$$

Define

$$\alpha(r,t) = \left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right) \tag{13}$$

$$\beta(r,t) = \left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right) \tag{14}$$

$$\chi(r,t) = \sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\cos\left(-\mathrm{t}\cdot\ln n\right)}{\mathrm{n}^{\mathrm{r}}} \tag{15}$$

$$\delta(r,t) = \sum_{\mathrm{n}=1}^{\infty}\frac{(-1)^{\mathrm{n}+1}\sin\left(-\mathrm{t}\cdot\ln n\right)}{\mathrm{n}^{\mathrm{r}}} \tag{16}$$

So

$$f(r,t) = \frac{(1-\alpha(r,t))\cdot\chi(r,t)-\beta(r,t)\cdot\delta(r,t)}{(1-\alpha(r,t))^2+\beta^2(r,t)} \tag{17}$$

$$g(r,t) = \frac{(1-\alpha(r,t))\cdot\delta(r,t)+\beta(r,t)\cdot\chi(r,t)}{(1-\alpha(r,t))^2+\beta^2(r,t)} \tag{18}$$

Derive that

$$\frac{\partial\alpha(r,t)}{\partial t} = \frac{\partial\left[\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right)\right]}{\partial t} \tag{19}$$

$$= -\left(2^{1-\mathrm{r}}\right)\sin\left(-\mathrm{t}\cdot\ln 2\right)\frac{\partial\alpha\left(-\mathrm{t}\cdot\ln 2\right)}{\partial t} \tag{20}$$

$$= \ln 2\cdot\left(2^{1-\mathrm{r}}\right)\sin\left(-\mathrm{t}\cdot\ln 2\right) \tag{21}$$

$$= \ln 2\cdot\beta(r,t) \tag{22}$$

$$\frac{\partial\beta(r,t)}{\partial t} = \frac{\partial\left[\left(2^{1-\mathrm{r}}\right) sin\left(-\mathrm{t}\cdot\ln 2\right)\right]}{\partial t} \tag{23}$$

$$= -\ln 2\cdot\left(2^{1-\mathrm{r}}\right)\cos\left(-\mathrm{t}\cdot\ln 2\right) \tag{24}$$

$$= -\ln 2\cdot\alpha(r,t) \tag{25}$$

$$\frac{\partial\chi(r,t)}{\partial t} = \frac{\partial\sum\limits_{\mathrm{n=1}}^{\infty}\frac{(-1)^{\mathrm{n+1}}\cos(-\mathrm{t}\cdot\ln n)}{\mathrm{n^r}}}{\partial t} = \sum_{\mathrm{n=1}}^{\infty}\frac{(-1)^{\mathrm{n+1}}\ln n\sin\left(-\mathrm{t}\cdot\ln n\right)}{\mathrm{n^r}} \tag{26}$$

$$\frac{\partial^2\chi(r,t)}{\partial t^2} = \frac{\partial\sum\limits_{\mathrm{n=1}}^{\infty}\frac{(-1)^{\mathrm{n+1}}\ln n\sin(-\mathrm{t}\cdot\ln n)}{\mathrm{n^r}}}{\partial t} = -\sum_{\mathrm{n=1}}^{\infty}\frac{(-1)^{\mathrm{n+1}}\ln^2 n\cos\left(-\mathrm{t}\cdot\ln n\right)}{\mathrm{n^r}} \tag{27}$$

$$\frac{\partial\delta(r,t)}{\partial t} = \frac{\partial\sum\limits_{\mathrm{n=1}}^{\infty}\frac{(-1)^{\mathrm{n+1}}\sin(-\mathrm{t}\cdot\ln n)}{\mathrm{n^r}}}{\partial t} = -\sum_{\mathrm{n=1}}^{\infty}\frac{(-1)^{\mathrm{n+1}}\ln n\cos\left(-\mathrm{t}\cdot\ln n\right)}{\mathrm{n^r}} \tag{28}$$

$$\frac{\partial^2\delta(r,t)}{\partial t^2} = \frac{-\partial\sum\limits_{\mathrm{n=1}}^{\infty}\frac{(-1)^{\mathrm{n+1}}\ln n\cos(-\mathrm{t}\cdot\ln n)}{\mathrm{n^r}}}{\partial t} = -\sum_{\mathrm{n=1}}^{\infty}\frac{(-1)^{\mathrm{n+1}}\ln^2 n\sin\left(-\mathrm{t}\cdot\ln n\right)}{\mathrm{n^r}} \tag{29}$$

Then

$$\frac{\partial f(r,t)}{\partial t} = \frac{\partial\frac{(1-\alpha(r,t))\cdot\chi(r,t)-\beta(r,t)\cdot\delta(r,t)}{(1-\alpha(r,t))^2+\beta^2(r,t)}}{\partial t} \tag{30}$$

$$= \frac{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]\frac{\partial[(1-\alpha(r,t))\cdot\chi(r,t)-\beta(r,t)\cdot\delta(r,t)]}{\partial t}}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2} -$$

$$\frac{\left[(1-\alpha(r,t))\cdot\chi(r,t)-\beta(r,t)\cdot\delta(r,t)\right]\frac{\partial\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]}{\partial t}}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2} \tag{31}$$

$$= \frac{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]\left[(1-\alpha(r,t))\frac{\partial\chi(r,t)}{\partial t}+\chi(r,t)\frac{\partial(1-\alpha(r,t))}{\partial t}\right]}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2}+$$

$$\frac{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]\left[-\beta(r,t)\frac{\partial\delta(r,t)}{\partial t}-\delta(r,t)\frac{\partial\beta(r,t)}{\partial t}\right]}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2}-$$

$$\frac{\left[(1-\alpha(r,t))\cdot\chi(r,t)-\beta(r,t)\cdot\delta(r,t)\right]\left[2\cdot(1-\alpha(r,t))\cdot\frac{\partial(1-\alpha(r,t))}{\partial t}\right]}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2}-$$

$$\frac{\left[(1-\alpha(r,t))\cdot\chi(r,t)-\beta(r,t)\cdot\delta(r,t)\right]\left[2\cdot\beta(r,t)\cdot\frac{\partial(\beta(r,t))}{\partial t}\right]}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2} \tag{32}$$

$$= \frac{(2-2\cdot\alpha(r,t))\left[(1-\alpha(r,t))\frac{\partial\chi(r,t)}{\partial t}-\ln 2\cdot\chi(r,t)\beta(r,t)\right]}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2}+$$

$$\frac{(2-2\cdot\alpha(r,t))\left[-\beta(r,t)\frac{\partial\delta(r,t)}{\partial t}+\ln 2\cdot\delta(r,t)\alpha(r,t)\right]}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2}+$$

$$\frac{\left[(1-\alpha(r,t))\cdot\chi(r,t)-\beta(r,t)\cdot\delta(r,t)\right](2\cdot\ln 2\cdot\beta(r,t))}{\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]^2} \tag{33}$$

$$\frac{\partial g(r,t)}{\partial t} = \frac{\partial\frac{(1-\alpha(r,t))\cdot\delta(r,t)+\beta(r,t)\cdot\chi(r,t)}{(1-\alpha(r,t))^2+\beta^2(r,t)}}{\partial t} \tag{34}$$

$$= \frac{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right] \frac{\partial[(1-\alpha(r,t))\cdot\delta(r,t)+\beta(r,t)\cdot\chi(r,t)]}{\partial t}}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} -$$

$$\frac{[(1-\alpha(r,t))\cdot\delta(r,t)+\beta(r,t)\cdot\chi(r,t)] \frac{\partial\left[(1-\alpha(r,t))^2+\beta^2(r,t)\right]}{\partial t}}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} \tag{35}$$

$$= \frac{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right] \left[(1-\alpha(r,t))\frac{\partial\delta(r,t)}{\partial t} + \delta(r,t)\frac{\partial(1-\alpha(r,t))}{\partial t}\right]}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} +$$

$$\frac{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right] \left[+\beta(r,t)\frac{\partial\chi(r,t)}{\partial t} + \chi(r,t)\frac{\partial\beta(r,t)}{\partial t}\right]}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} -$$

$$\frac{[(1-\alpha(r,t))\cdot\delta(r,t)+\beta(r,t)\cdot\chi(r,t)] \left[2\cdot(1-\alpha(r,t))\cdot\frac{\partial(1-\alpha(r,t))}{\partial t}\right]}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} -$$

$$\frac{[(1-\alpha(r,t))\cdot\delta(r,t)+\beta(r,t)\cdot\chi(r,t)] \left[2\cdot\beta(r,t)\cdot\frac{\partial(\beta(r,t))}{\partial t}\right]}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} \tag{36}$$

$$= \frac{(2-2\cdot\alpha(r,t)) \left[(1-\alpha(r,t))\frac{\partial\delta(r,t)}{\partial t} - \ln 2\cdot\delta(r,t)\beta(r,t)\right]}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} +$$

$$\frac{(2-2\cdot\alpha(r,t)) \left[\beta(r,t)\frac{\partial\chi(r,t)}{\partial t} - \ln 2\cdot\chi(r,t)\alpha(r,t)\right]}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} +$$

$$\frac{[(1-\alpha(r,t))\cdot\delta(r,t)+\beta(r,t)\cdot\chi(r,t)]\,(2\cdot\ln 2\cdot\beta(r,t))}{\left[(1-\alpha(r,t))^2 + \beta^2(r,t)\right]^2} \tag{37}$$

Define

$$\varepsilon(r,t) = (1-\alpha(r,t))\frac{\partial\chi(r,t)}{\partial t} - \ln 2\cdot\chi(r,t)\beta(r,t) - \beta(r,t)\frac{\partial\delta(r,t)}{\partial t} + \ln 2\cdot\delta(r,t)\alpha(r,t) \tag{38}$$

$$\phi(r,t) = (1-\alpha(r,t))\frac{\partial\delta(r,t)}{\partial t} - \ln 2\cdot\delta(r,t)\beta(r,t) + \beta(r,t)\frac{\partial\chi(r,t)}{\partial t} - \ln 2\cdot\chi(r,t)\alpha(r,t) \tag{39}$$

$$\varphi(r,t) = (1-\alpha(r,t))\cdot\chi(r,t) - \beta(r,t)\cdot\delta(r,t) \tag{40}$$

$$\gamma(r,t) = (1-\alpha(r,t))\cdot\delta(r,t) + \beta(r,t)\cdot\chi(r,t) \tag{41}$$

$$h(r,t) = \frac{\frac{\partial f(r,t)}{\partial t}}{\frac{\partial g(r,t)}{\partial t}} \tag{42}$$

Then

$$h(r,t) = \frac{(2-2\cdot\alpha(r,t))\,\varepsilon(r,t) + \varphi(r,t)\,(2\cdot\ln 2\cdot\beta(r,t))}{(2-2\cdot\alpha(r,t))\,\phi(r,t) + \gamma(r,t)\,(2\cdot\ln 2\cdot\beta(r,t))} \tag{43}$$

$$= \frac{(1-\alpha(r,t))\,\varepsilon(r,t) + \ln 2\cdot\varphi(r,t)\beta(r,t)}{(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)} \tag{44}$$

$$\frac{\partial h(r,t)}{\partial t} = \frac{\left[(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)\right]\frac{\partial\left[(1-\alpha(r,t))\varepsilon(r,t)+\ln 2\cdot\varphi(r,t)\beta(r,t)\right]}{\partial t}}{\left[(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)\right]^2}$$

$$-\frac{\left[(1-\alpha(r,t))\,\varepsilon(r,t)+\ln 2\cdot\varphi(r,t)\beta(r,t)\right]\frac{\partial\left[(1-\alpha(r,t))\phi(r,t)+\ln 2\cdot\gamma(r,t)\beta(r,t)\right]}{\partial t}}{\left[(1-\alpha(r,t))\,\phi(r,t)+\ln 2\cdot\gamma(r,t)\beta(r,t)\right]^2} \tag{45}$$

$$\frac{\partial\varepsilon(r,t)}{\partial t}$$

$$=\frac{\partial\left[(1-\alpha(r,t))\frac{\partial\chi(r,t)}{\partial t}-\ln 2\cdot\chi(r,t)\beta(r,t)-\beta(r,t)\frac{\partial\delta(r,t)}{\partial t}+\ln 2\cdot\delta(r,t)\alpha(r,t)\right]}{\partial t}$$

$$=(1-\alpha(r,t))\frac{\partial^2\chi(r,t)}{\partial t^2}-\ln 2\cdot\beta(r,t)\frac{\partial\chi(r,t)}{\partial t}+\ln 2\cdot\beta(r,t)\frac{\partial\chi(r,t)}{\partial t}+\ln^2 2\cdot\chi(r,t)\alpha(r,t)$$

$$-\beta(r,t)\frac{\partial^2\delta(r,t)}{\partial t^2}+\ln 2\cdot\alpha(r,t)\frac{\partial\delta(r,t)}{\partial t}+\ln^2 2\cdot\delta(r,t)\beta(r,t)+\ln 2\cdot\alpha(r,t)\frac{\partial\delta(r,t)}{\partial t}$$

$$=(1-\alpha(r,t))\frac{\partial^2\chi(r,t)}{\partial t^2}+\ln^2 2\cdot\chi(r,t)\alpha(r,t)-\beta(r,t)\frac{\partial^2\delta(r,t)}{\partial t^2}+$$

$$2\cdot\ln 2\cdot\alpha(r,t)\frac{\partial\delta(r,t)}{\partial t}+\ln^2 2\cdot\delta(r,t)\beta(r,t) \tag{46}$$

$$\frac{\partial\phi(r,t)}{\partial t}$$

$$=\frac{\partial\left[(1-\alpha(r,t))\frac{\partial\delta(r,t)}{\partial t}-\ln 2\cdot\delta(r,t)\beta(r,t)+\beta(r,t)\frac{\partial\chi(r,t)}{\partial t}-\ln 2\cdot\chi(r,t)\alpha(r,t)\right]}{\partial t}$$

$$=(1-\alpha(r,t))\frac{\partial^2\delta(r,t)}{\partial t^2}-\ln 2\cdot\beta(r,t)\frac{\partial\delta(r,t)}{\partial t}-\ln 2\cdot\beta(r,t)\frac{\partial\delta(r,t)}{\partial t}+\ln^2 2\cdot\alpha(r,t)\delta(r,t)$$

$$-\ln 2\cdot\alpha(r,t)\frac{\partial\chi(r,t)}{\partial t}+\beta(r,t)\frac{\partial^2\chi(r,t)}{\partial t^2}-\ln^2 2\cdot\chi(r,t)\beta(r,t)-\ln 2\cdot\alpha(r,t)\frac{\partial\chi(r,t)}{\partial t}$$

$$=(1-\alpha(r,t))\frac{\partial^2\delta(r,t)}{\partial t^2}-2\ln 2\cdot\beta(r,t)\frac{\partial\delta(r,t)}{\partial t}+\ln^2 2\cdot\alpha(r,t)\delta(r,t)-$$

$$2\ln 2\cdot\alpha(r,t)\frac{\partial\chi(r,t)}{\partial t}+\beta(r,t)\frac{\partial^2\chi(r,t)}{\partial t^2}-\ln^2 2\cdot\chi(r,t)\beta(r,t) \quad (47)$$

$$\frac{\partial\varphi(r,t)}{\partial t}=\frac{\partial\left[(1-\alpha(r,t))\cdot\chi(r,t)-\beta(r,t)\cdot\delta(r,t)\right]}{\partial t} \quad (48)$$

$$=(1-\alpha(r,t))\frac{\partial\chi(r,t)}{\partial t}-\ln 2\cdot\beta(r,t)\chi(r,t)+\ln 2\cdot\alpha(r,t)\cdot\delta(r,t)-\beta(r,t)\cdot\frac{\partial\delta(r,t)}{\partial t}$$

$$(49)$$

$$\frac{\partial\gamma(r,t)}{\partial t}=\frac{\partial\left[(1-\alpha(r,t))\cdot\delta(r,t)+\beta(r,t)\cdot\chi(r,t)\right]}{\partial t} \quad (50)$$

$$=(1-\alpha(r,t))\frac{\partial\delta(r,t)}{\partial t}-\ln 2\cdot\beta(r,t)\delta(r,t)-\ln 2\cdot\alpha(r,t)\cdot\chi(r,t)+\beta(r,t)\cdot\frac{\partial\chi(r,t)}{\partial t}$$

$$(51)$$

Define

$$\frac{\partial h(r,t)}{\partial t}=\frac{\mu(r,t)}{\nu(r,t)} \quad (52)$$

Then

$$\mu(r,t) = \left[(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)\right]\cdot$$

$$\frac{\partial\left[(1-\alpha(r,t))\,\varepsilon(r,t) + \ln 2\cdot\varphi(r,t)\beta(r,t)\right]}{\partial t} -$$

$$\left[(1-\alpha(r,t))\,\varepsilon(r,t) + \ln 2\cdot\varphi(r,t)\beta(r,t)\right]\cdot$$

$$\frac{\partial\left[(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)\right]}{\partial t} \tag{53}$$

$$= \left[(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)\right]\cdot\left(-\ln 2\cdot\beta(r,t)\varepsilon(r,t)\right) +$$

$$\left[(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)\right]\cdot\left[(1-\alpha(r,t))\,\frac{\partial\varepsilon(r,t)}{\partial t}\right] +$$

$$\left[(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)\right]\cdot\left(-\ln^2 2\cdot\alpha(r,t)\varphi(r,t)\right) +$$

$$\left[(1-\alpha(r,t))\,\phi(r,t) + \ln 2\cdot\gamma(r,t)\beta(r,t)\right]\cdot\left(\ln 2\cdot\beta(r,t)\frac{\partial\varphi(r,t)}{\partial t}\right) -$$

$$\left[(1-\alpha(r,t))\,\varepsilon(r,t) + \ln 2\cdot\varphi(r,t)\beta(r,t)\right]\cdot\left[(1-\alpha(r,t))\,\frac{\partial\phi(r,t)}{\partial t}\right] -$$

$$\left[(1-\alpha(r,t))\,\varepsilon(r,t) + \ln 2\cdot\varphi(r,t)\beta(r,t)\right]\cdot\left(-\ln 2\cdot\beta(r,t)\phi(r,t)\right) -$$

$$[(1-\alpha(r,t))\,\varepsilon(r,t)+\ln 2\cdot\varphi(r,t)\beta(r,t)]\cdot\left(-\ln^2 2\cdot\alpha(r,t)\gamma(r,t)\right)-$$

$$[(1-\alpha(r,t))\,\varepsilon(r,t)+\ln 2\cdot\varphi(r,t)\beta(r,t)]\cdot\left(\ln 2\cdot\beta(r,t)\frac{\partial\gamma(r,t)}{\partial t}\right) \tag{54}$$

$$=-\ln 2\cdot\beta(r,t)\varepsilon(r,t)\,(1-\alpha(r,t))\,\phi(r,t)+(1-\alpha(r,t))^2\phi(r,t)\frac{\partial\varepsilon(r,t)}{\partial t}-$$

$$\ln^2 2\cdot\alpha(r,t)\varphi(r,t)\,(1-\alpha(r,t))\,\phi(r,t)+\ln 2\cdot\beta(r,t)\,(1-\alpha(r,t))\,\phi(r,t)\frac{\partial\varphi(r,t)}{\partial t}-$$

$$\ln^2 2\cdot\beta^2(r,t)\varepsilon(r,t)\gamma(r,t)+\ln 2\cdot\gamma(r,t)\beta(r,t)\,(1-\alpha(r,t))\,\frac{\partial\varepsilon(r,t)}{\partial t}-$$

$$\ln^3 2\cdot\alpha(r,t)\varphi(r,t)\gamma(r,t)\beta(r,t)+\ln^2 2\cdot\beta^2(r,t)\gamma(r,t)\frac{\partial\varphi(r,t)}{\partial t}-$$

$$(1-\alpha(r,t))^2\varepsilon(r,t)\frac{\partial\phi(r,t)}{\partial t}+\ln 2\cdot\beta(r,t)\phi(r,t)\,(1-\alpha(r,t))\,\varepsilon(r,t)+$$

$$\ln^2 2\cdot\alpha(r,t)\gamma(r,t)\,(1-\alpha(r,t))\,\varepsilon(r,t)-\ln 2\cdot\beta(r,t)\,(1-\alpha(r,t))\,\varepsilon(r,t)\frac{\partial\gamma(r,t)}{\partial t}-$$

$$\ln 2\cdot\varphi(r,t)\beta(r,t)\,(1-\alpha(r,t))\,\frac{\partial\phi(r,t)}{\partial t}+\ln^2 2\cdot\varphi(r,t)\beta^2(r,t)\phi(r,t)-$$

$$\ln^3 2\cdot\alpha(r,t)\gamma(r,t)\varphi(r,t)\beta(r,t)+\ln^2 2\cdot\beta^2(r,t)\varphi(r,t)\frac{\partial\gamma(r,t)}{\partial t} \tag{55}$$

Verification

When r=0.5, we draw a curve using equation (55).If an extremum occurs, it indicates the existence of non trivial zeros, where negative extremum is a counterexample.We can calculate the numerical value of non trivial zero counterexamples, which would be a very large number.

Acknowledgements

I wrote this paper is to commemorate Professor Gong-Sheng.In the process of proving the Riemann hypothesis, British mathematician Hardy made significant contributions. His student Hua-Luogeng brought modern mathematics, especially number theory,to China in 1950s. Professor Gong-Sheng was one of the best students of Hua-Luogeng, and he cultivated my mathematical literacy at University of Science and Technology of China. From Hardy to me, it has been four generations of research,a full hundred years. At the same time, I would like to thank Dr.Lin-Xiao for guiding me in the framework, determining what readers want to know and how to express my thoughts. Thanks to Dr. Atom for helping me refine my language and summarize my work content in the shortest possible sentences. Thanks to Brother Math for recommending computer software and demonstrating how to use it.This work involves many fields, and I have received everyone's help.

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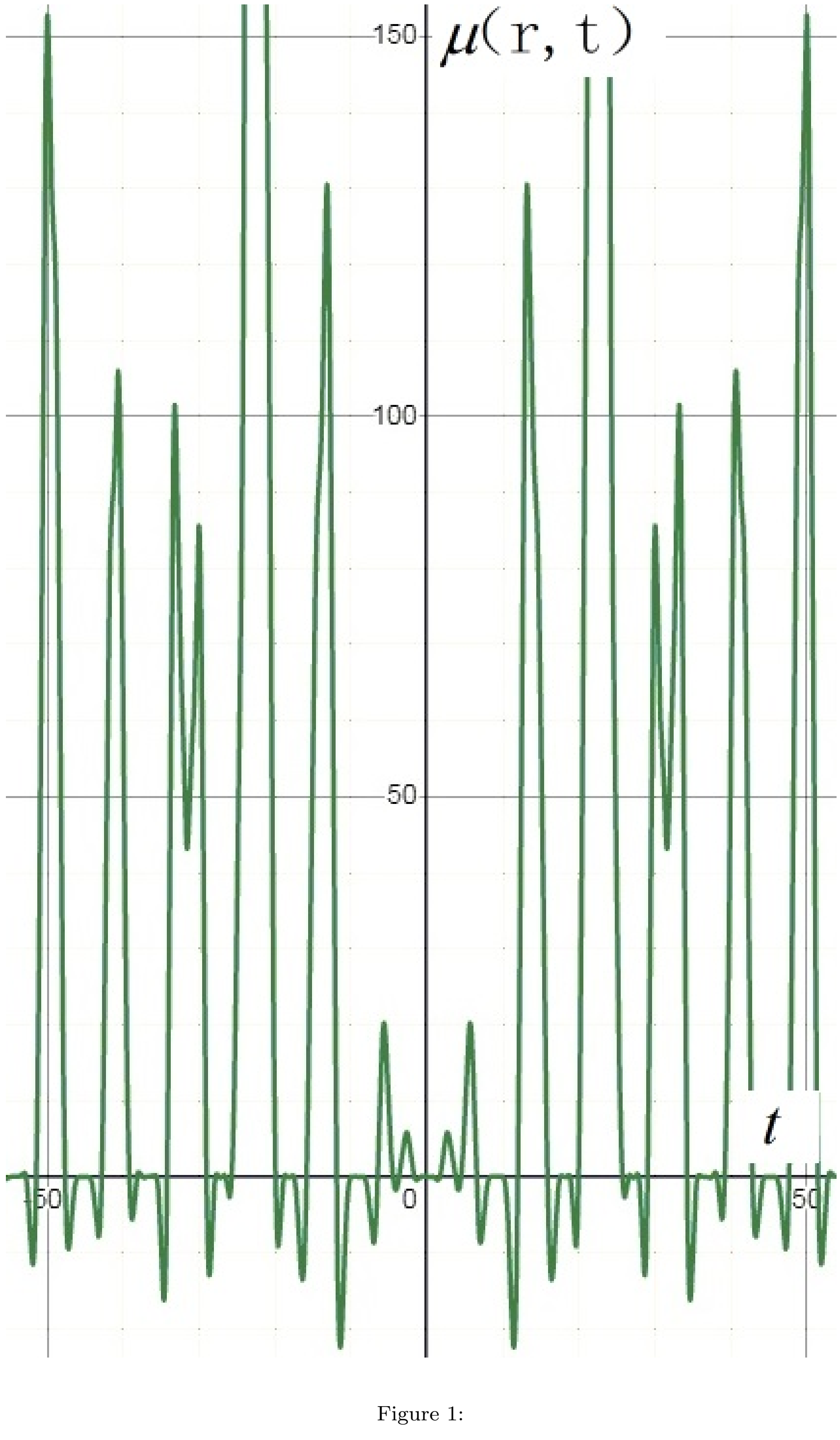

Figure 1: