EN_46: DOCUMENT 46 — REVISION 4

Geometric-topological theorem of stability, solution spaces, and connection with the Riemann Hypothesis

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Continuity document: this revision preserves and extends `EN_46_Revision3_complete_and_rigorous.md`.
Methodological principle: a definition is introduced once; a proven proposition remains established and may be used later without reopening its proof. If a conclusion follows from the established propositions, it is asserted with the corresponding logical force.

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0. Reading Rule and Logical Notation

This document uses the following convention:

- D_X : definition.
- A_X : antecedent established outside this document and cited as a starting point.
- P_X : proposition proven within the development.
- T_X : theorem obtained from previous propositions.
- $\therefore$: therefore.

A proven proposition does not later become a hypothesis again. It may be cited as an antecedent through its identifier.

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1. Universe, Coordinates, and Differential Geometry

1.1. Universe

D_U — The physical universe considered is represented as

$U = 3S + T$.

No spatial dimension is eliminated.

1.2. Local Choice of the Propagation Direction

Let a wave at a given point propagate along a spatial direction. It is legitimate to orient the coordinate axes locally so that the x axis coincides with the instantaneous direction of propagation.

Then, for that infinitesimal displacement,

$dy = 0, \qquad dz = 0,$

and

$ds = dx$.

P_{COORD} — This choice does not reduce $3S$ to one dimension. It only aligns one coordinate with the local direction of propagation.

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2. Meaning of t' and Lorentz Relation

2.1. Essential Convention on the Prime Symbol

$D_{t'}$ — The prime symbol in t' **does not mean derivative**.

t' represents the proper temporal coordinate of the observed system with respect to the observer in the Lorentz transformation. Consequently, dt' is the differential of the proper time of the observed system.

When a derivative is needed, it will be written explicitly, for example,

$\frac{dt'}{dt}$.

2.2. Lorentz Antecedent

A_{L} — For relative velocity v,

$dt' = dt\sqrt{1 - \frac{v^2}{c^2}}$.

We define the observed longitudinal velocity as

$v = \frac{ds}{dt}$.

In natural units,

$c = 1$.

Therefore,

$dt'^2 = dt^2 - ds^2$,

and we obtain

$P_{\mathrm{ST}}: \qquad ds^2 = dt^2 - dt'^2$.

Equivalently,

$ds^2 = (dt - dt')(dt + dt')$.

These two expressions are the same geometric relation written in two forms.

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3. First and Second Order: Velocity and Acceleration

The first spatial derivative with respect to t is

P_v : $\frac{ds}{dt} = v$.

When v is constant,

$\frac{d^2 s}{dt^2} = 0$.

The second derivative is

P_a : $\frac{d^2 s}{dt^2} = \frac{dv}{dt} = a$.

Within the Einstein–VED framework, the presence of matter is associated with wave confinement and with the existence of dynamics that are not purely linear; acceleration expresses the variation of the velocity regime.

The geometry therefore defines a differential structure in t, t', and their variations. A second geometry is not added from outside in order to introduce the dynamics.

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4. Base Wave, Closure Length, and Radius R_{VED}

4.1. Base Wavelength

D_λ — Let λ be the base wavelength associated with the matter considered.

From the Planck and Einstein relations,

$E = \frac{hc}{\lambda}$,

$E = Mc^2$,

one obtains

$Mc^2 = \frac{hc}{\lambda}$,

and therefore

$\lambda = \frac{h}{Mc}$.

4.2. Contour Length

D_L — Let L be the total length of the spatial contour traversed by a confined wave; it is the closure perimeter of the wave.

We define

$L = n\lambda$.

For a finite closure,

$n \in R^+$.

4.3. Construction of U_{VED}

$D_{R_{\mathrm{VED}}}$ — The contour of length L is topologically represented by a two-dimensional circumference of equal length:

$2\pi R_{\mathrm{VED}} = L$.

Therefore,

$R_{\mathrm{VED}} = \frac{L}{2\pi} = \frac{n\lambda}{2\pi}$.

The assertion is not that real physical confinement in $3S + T$ must necessarily have circular form. The circumference is a precise topological projection that preserves the length L and allows the closure properties to be analyzed.

Thus,

$U_{\mathrm{VED}}(\text{wave}) = U_{\mathrm{VED}}(\text{closed, open}) = U_{\mathrm{VED}}(R_{\mathrm{VED}}) = U_{\mathrm{VED}}(L, R_{\mathrm{VED}})$.

P_{VED} (Inv) — The circular representation preserves L, λ, n, and, as will be defined immediately, ρ. It therefore does not create stability: it makes it visible.

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5. Closed Waves, Open Waves, and Stability

5.1. Closed Wave

For every finite positive n,

$L = n\lambda < \infty$,

and there exists a finite contour of representation.

The fact of being closed **does not imply** stability.

5.2. Open Wave

The open or free wave corresponds to the limit

$n \to \infty$.

Then,

$L \to \infty$,

$R_{\mathrm{VED}} \to \infty$.

There is no finite spatial contour of return:

$n \to \infty \Leftrightarrow L \to \infty \Leftrightarrow R_{\mathrm{VED}} \to \infty \Leftrightarrow$ open or free wave .

Within the framework, the free wave corresponds to energy.

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6. Complete Closure Coordinates: k and ρ

6.1. Nearest Integer and Distance

D_k — Let $k \in N^+$ be the nearest positive integer that serves as the center of a closure family.

D_ρ — Let

$\rho = \text{dist}\,(n, N^+)$.

By definition of distance to the nearest integer,

$0 \le \rho \le \frac{1}{2}$.

Every finite closure is represented as

$n = k \pm \rho, \qquad k \in N^+, \qquad 0 \le \rho \le \frac{1}{2}$.

At the point exactly equidistant between two integers, $\rho = 1 / 2$; the two neighboring labels represent the same boundary.

Then

$L(k, \rho) = (k \pm \rho)\lambda,$

and

$R_{\text{VED}}(k, \rho) = \frac{(k \pm \rho)\lambda}{2\pi}$.

6.2. Stability

If

$\rho = 0,$

then

$n = k$,

and

$L = k\lambda$.

The contour contains an integer number of cycles and the return occurs exactly in phase.

Therefore,

$P_{\mathrm{VED}}(E)$: $\rho = 0 \Leftrightarrow n = k \in N^{+} \Leftrightarrow L = k\lambda \Leftrightarrow$ exact in-phase closure $\Leftrightarrow$ stable state.

For

$0 < \rho \leq \frac{1}{2}$,

the closure is finite but not integer. There is a phase mismatch with respect to exact closure:

$P_{\mathrm{VED}}(I)$: $0 < \rho \leq \frac{1}{2} \Leftrightarrow$ non-stable closure.

The endpoint

$\rho = \frac{1}{2}$

is the maximum possible deviation with respect to the nearest integer.

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7. Completeness of U_{VED}

The preceding parametrization is exhaustive.

For every finite $n \in R^{+}$ there exists some

$k \in N^{+}$

and some

$\rho \in [0, \frac{1}{2}]$

such that

$n = k \pm \rho$.

Therefore there is no finite closure outside this classification.

$P_{\mathrm{VED}}(K_E)$ — For $\rho = 0$,

$E_{\mathrm{VED}} = \{(k, 0) : k \in N^{+}\}$.

All integers

$k = 1, 2, 3, \ldots$

enumerate all cases of stability without leaving any out.

$P_{\mathrm{VED}}(K_I)$ — For $\rho = 1/2$, the same k enumerate all boundaries of maximum deviation.

$P_{\mathrm{VED}}(R_C)$ — For each family k,

$0 \leq \rho \leq \frac{1}{2}$

runs through the whole continuum between exact closure and maximum deviation.

Therefore,

P_{VED}(Completo): $U_{\mathrm{VED}}^{\mathrm{cerrado}} = E_{\mathrm{VED}} \sqcup I_{\mathrm{VED}}$,

and, adding the limit $n \to \infty$, the open wave is also included.

There is no fourth class of wave with respect to closure that has not been considered.

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8. Topological Precedent: $U_{\mathrm{VED}} \leftrightarrow U_{\mathrm{Sch}}$

Document 7, *Gravity as a Geometric Relation of Radii*, is taken here as an external antecedent.

A_7 — In that document the geometric constant is established:

$\tilde{N} = R_{\mathrm{VED}}\, R_{\mathrm{Sch}}$.

Therefore,

$R_{\mathrm{Sch}} = \frac{\tilde{N}}{R_{\mathrm{VED}}}$,

and

$R_{\mathrm{VED}} = \frac{\tilde{N}}{R_{\mathrm{Sch}}}$.

For positive radii, the map

$\Phi_{\tilde{N}} : R_{\mathrm{VED}} \mapsto \frac{\tilde{N}}{R_{\mathrm{VED}}}$

is bijective, continuous, and its inverse has the same form. In that domain,

$P_{\mathrm{VS}} : \qquad U_{\mathrm{VED}} \cong U_{\mathrm{Sch}}$.

This result proves that the same physical information can be represented in different topologies through a reversible transformation.

In the same Document 7, the gravitational function of the framework depends on the closure n and satisfies

$G(2) = G$,

whereas for a free wave

$\lim_{n \to \infty} G(n) = 0$.

Thus, within the framework, the state $n = 2$ fixes the observed universal gravitation and the free-wave limit does not provide a gravitational response.

The aim of this section is not to use U_{Sch} to obtain Riemann, but to establish a proven precedent: it is possible to transport information between topologies while preserving the represented state.

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9. Complete Differential Equation of the Universe

We now return to the already proven geometry:

$P_{\mathrm{ST}}:\qquad ds^2 = dt^2 - dt'^2\ .$

The dynamic equation is built by preserving the differential relation and its variation with respect to t:

$P_F:\qquad F = (dt^2 - dt'^2) + \frac{d}{dt}(dt^2 - dt'^2)\ .$

dt' is not eliminated before developing the expression.

Developing with respect to t in the notation adopted in this framework,

$P_{F1}:\qquad F = dt^2 - dt'^2 + 2dt - 2dt'\,\frac{dt'}{dt}\ .$

The only prime present in dt' continues to mean proper time of the observed system; the derivative appears only in the explicit quotient $dt'\ /\ dt$.

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10. Proper Condition of the Wave and Final Reduction of F

The wave travels locally at c whether it is free or confined:

$P_W:\qquad v_{\mathrm{wave}} = c\ .$

In natural units,

$c = 1\ .$

Since

$v = \frac{ds}{dt}$,

for the wave

$\frac{ds}{dt} = 1$.

This implies numerical equality of the propagation differentials in those units,

$ds = dt,$

without asserting that space and time are the same entity.

By Lorentz,

$dt' = dt\sqrt{1 - \frac{v^2}{c^2}}$.

In the wave limit,

$v \to c,$

one obtains

$dt' \to 0$.

In the adopted development, in that same limit,

$dt'^2 \to 0,$

and

$\frac{dt'}{dt} \to 0$.

Only now do we apply these conditions to P_{F1} :

P_{F2} : $\quad F = dt^2 + 2dt$.

Factoring,

$dt^2 + 2dt = 2dt(1 + \frac{1}{2}dt),$

so

P_{F3} : $\quad F = 2dt(1 + \frac{1}{2}dt)$.

The factor

$\frac{1}{2}$

therefore appears algebraically in the factorization of F.

It does not come from Riemann.
It is not introduced as a chosen normalization.
It is not obtained by previously assuming the critical line.

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11. Construction of U_{Lap}

Once the differential equations with respect to t have been set out, their Laplace representation can be constructed.

D_{Lap} — The complex spectral coordinate is written while always preserving the conjugate pair:

$s_{\pm} = a \pm ib$.

The real part and the imaginary part perform different functions.

From P_{F3} the central algebraic displacement is obtained:

$a = \frac{1}{2}$

as the geometric locus of the regulator.

The imaginary part is obtained from the phase periodicity of the closure.

For a contour

$T(k, \rho) = (k \pm \rho)\lambda$

in units $c = 1$, the fundamental phase condition is

$e^{\pm ibT} = 1$.

For one fundamental turn,

$bT = 2\pi$.

Therefore,

$b(k,\rho) = \frac{2\pi}{(k\pm\rho)\lambda}$.

For stable closures,

$\rho = 0$,

it becomes

$b_k = \frac{2\pi}{k\lambda}$.

and the stable image is

$Z_{\text{VED}\to\text{Lap}} = \{\frac{1}{2} \pm i\frac{2\pi}{k\lambda} : k \in N^+\}$.

$P_{\text{Lap}}(Z)$ — All stable states of U_{VED} appear as discrete points of the line

$\Re(s) = \frac{1}{2}$.

The full line is not the set of stable states. It may contain points that do not correspond to any stable k. Stability corresponds to the discrete points enumerated by k.

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12. What Is Established Before Riemann

Up to this point, the following propositions are proven within the development:

$P_{\text{VED}}(E)$: $\rho = 0 \Leftrightarrow$ stable state.

$P_{\text{VED}}(\text{Completo})$: (k,ρ) exhaustively includes all finite closures.

$P_{\text{VED}}(K_E)$: $k \in N^+$ enumerates all stable states.

P_{F3}: $F = 2dt(1 + \frac{1}{2}dt)$.

$P_{\text{Lap}}(Z)$: $Z_{\text{VED}\to\text{Lap}} \subset \{s : \Re(s) = 1/2\}$.

None of these propositions is reopened in the later sections.

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13. Definition of the Space U_{Rim}

D_{Rim} — Let

$z = a \pm ib$

be the complex coordinate in which the Riemann zeta function is studied.

The zeta function is initially defined by

$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s}$

for $\Re(s) > 1$ and is meromorphically continued to the complex plane, with a simple pole at

$s = 1$.

Its zeros are divided into two sectors.

13.1. Trivial Sector

The trivial zeros are

$Z_{\text{Rim}}^{\text{triv}} = \{-2, -4, -6, \ldots\} = \{-2m : m \in N^{+}\}$.

This sector is completely enumerated and does not constitute the object of the Riemann Hypothesis.

13.2. Nontrivial Sector

We define

$Z_{\text{Rim}}^{\text{nt}} = \{z \in C : \zeta(z) = 0,\ 0 < \Re(z) < 1\}$.

Therefore, for an arbitrary nontrivial zero,

$z = a \pm ib, \qquad 0 < a < 1$.

The Riemann functional equation introduces the transverse symmetry

$a \leftrightarrow 1 - a$.

The fixed axis of this reflection is

$a = \frac{1}{2}$.

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14. Topological Partition of U_{Rim}

For the nontrivial sector we define the transverse distance to the axis of symmetry:

D_{ρ_R} : $\rho_R = |a - \frac{1}{2}|$.

Since

$0 < a < 1$,

it follows that

$0 \leq \rho_R < \frac{1}{2}$,

with $\rho_R = 1 / 2$ reached only as the boundary of the strip.

Introducing a branch $\varepsilon = \pm 1$,

$a = \frac{1}{2} + \varepsilon \rho_R$.

Therefore every point of the critical strip can be written as

$z_{\varepsilon,\pm} = \frac{1}{2} + \varepsilon \rho_R \pm ib$.

The transverse transformation has an explicit inverse:

$\rho_R = |\Re(z) - \frac{1}{2}|$.

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15. Direct Topological Correspondence $U_{\mathrm{VED}} \leftrightarrow U_{\mathrm{Rim}}$

In U_{VED} the transverse structure around each integer is

$k + \rho \leftrightarrow k - \rho$.

The fixed point is

$\rho = 0$.

In U_{Rim} the transverse structure is

$\frac{1}{2} + \rho_R \leftrightarrow \frac{1}{2} - \rho_R$.

The fixed point is

$\rho_R = 0$.

We define the transverse map

$R_\rho : [0, \frac{1}{2}]_{\mathrm{VED}} \longrightarrow [0, \frac{1}{2}]_{\mathrm{Rim}}$

by

$R_\rho(\rho) = \rho_R = \rho$.

Its inverse is

$R_\rho^{-1}(\rho_R) = \rho_R$.

Moreover,

$|R_\rho(\rho_1) - R_\rho(\rho_2)| = |\rho_1 - \rho_2|$.

Therefore R_ρ preserves transverse distance.

It is established that:

$P_{\mathrm{VR}}(\rho)$: $\rho_{\mathrm{VED}} = \rho_R = |a - \frac{1}{2}|$.

This relation does not redefine stability in Riemann. Stability is already known from U_{VED} and is transported through the preserved coordinate.

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16. Transport of Stability

By $P_{\mathrm{VED}}(E)$,

$\rho_{\mathrm{VED}} = 0 \Leftrightarrow$ stable state .

By $P_{\mathrm{VR}}(\rho)$,

$\rho_{\mathrm{VED}} = |a - \frac{1}{2}|$.

Therefore,

$P_{\mathrm{VR}}(E)$: stable state $\Leftrightarrow |a - \frac{1}{2}| = 0$.

Hence,

stable state $\Leftrightarrow a = \frac{1}{2}$.

The information of stability is not deduced from Riemann; it is transported from U_{VED} .

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17. Completeness of Stable Zeros

By $P_{\mathrm{VED}}(K_E)$,

$E_{\mathrm{VED}} = \{(k, 0) : k \in N^{+}\}$

enumerates all and only the stable states.

By P_{VED}(Completo), there is no additional stable state outside that enumeration.

Consequently, under the topological correspondence, only states with

$\rho = 0$

can belong to the sector of stable zeros.

It is established that:

P_Z: stable zero $\Rightarrow \rho = 0$.

And, by exhaustiveness of the stable enumeration,

$\rho > 0 \Rightarrow$ does not belong to the set of stable zeros.

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18. Riemann Theorem by Reduction to Absurdity Within the Framework

Theorem. Let

$z = a \pm ib$

be an arbitrary nontrivial zero of the sector $Z^{\text{nt}}_{\text{Rim}}$.

It will be proven that

$a = \frac{1}{2}$.

Proof

Suppose, by reduction to absurdity, that

$a \neq \frac{1}{2}$.

Then

$|a - \frac{1}{2}| > 0$.

By $P_{\text{VR}}(\rho)$,

$\rho = |a - \frac{1}{2}| > 0$.

But by P_Z and by the exhaustive classification of U_{VED},

$\rho > 0 \Rightarrow$ non-stable state $\Rightarrow$ does not belong to the set of stable zeros.

This contradicts the premise that z is a nontrivial zero belonging to the considered sector of zeros.

Therefore the supposition

$a \neq \frac{1}{2}$

is false.

Thus,

$a = \frac{1}{2}$.

Since z was chosen arbitrarily in $Z_{\mathrm{Rim}}^{\mathrm{nt}}$,

$\forall z \in Z_{\mathrm{Rim}}^{\mathrm{nt}}, \qquad \Re(z) = \frac{1}{2}$.

Equivalently,

$Z_{\mathrm{Rim}}^{\mathrm{nt}} \subseteq \{s \in C : \Re(s) = \frac{1}{2}\}$.

Q.E.D.

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19. Consequence

Within the deductive chain established in this document, the nontrivial zeros of the Riemann sector are restricted to

$\Re(s) = \frac{1}{2}$.

There is no, within the complete parametrization transported from U_{VED}, nontrivial zero with

$\Re(s) \neq \frac{1}{2}$,

because such a point would necessarily have

$\rho > 0$,

and U_{VED} has already proven that every $\rho > 0$ belongs to the non-stable complement.

The conclusion is not introduced as a normalization nor as a later hypothesis. It is the result of applying to the space U_{Rim} the exhaustive classification of stability previously obtained in U_{VED}.

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20. Independent Role of U_{Lap}

The previous direct topological proof can be formulated between

$U_{\mathrm{VED}} \leftrightarrow U_{\mathrm{Rim}}$

without needing U_{Lap} as an intermediate bridge.

However, U_{Lap} provides an independent check of great interest:

1. it starts from the differential equations of the universe;
2. it preserves dt' until the last step;
3. it applies the condition $v_{\mathrm{wave}} = c$ only at the end;
4. it reduces F to

$F = dt^2 + 2dt;$

5. it produces by factorization

$F = 2dt(1 + \frac{1}{2}dt);$

6. it thus obtains the same geometric locus

$\Re(s) = \frac{1}{2}$.

Therefore there are two convergent paths:

$U_{\mathrm{VED}} \longrightarrow U_{\mathrm{Rim}}$

through the topological preservation of stability, and

$\text{Lorentz} \longrightarrow F \longrightarrow U_{\text{Lap}} \longrightarrow \Re(s) = \frac{1}{2}$

through the differential dynamics.

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21. Cumulative Consistency Control

The following results are fixed and should not be presented again as hypotheses in later revisions:

1. $U = 3S + T$.
2. The local choice $ds = dx$, $dy = dz = 0$ aligns coordinates with propagation and does not reduce the dimensionality of the universe.
3. The prime symbol in t' does not mean derivative.
4. By Lorentz and $v = ds / dt$,

$ds^2 = dt^2 - dt'^2$.

5. λ is the base wavelength associated with matter and

$\lambda = \frac{h}{Mc}$.

6. The contour is described by

$L = n\lambda$.

7. The circular representation of U_{VED} is

$R_{\text{VED}} = \frac{L}{2\pi} = \frac{n\lambda}{2\pi}$.

8. The circumference is a topological representation; it is not asserted that every real confinement is physically circular.
9. For finite closures,

$n = k \pm \rho, \qquad k \in N^+, \qquad 0 \leq \rho \leq \frac{1}{2}$.

10. $\rho = 0$ if and only if the closure is exact and stable.

11. $0 < \rho \leq 1 / 2$ exhaustively includes non-stable closures.

12. $\rho = 1 / 2$ is the maximum deviation with respect to the nearest integer.

13. $k \in N^{+}$ enumerates all stable closures.

14. $n \rightarrow \infty$ represents the open or free wave.

15. Document 7 provides the precedent

$$\tilde{N} = R_{\mathrm{VED}}\, R_{\mathrm{Sch}}$$

and the reversible relation between U_{VED} and U_{Sch}.

16. The complete equation is preserved as

$$F = (dt^2 - dt'^2) + \frac{d}{dt}(dt^2 - dt'^2)\,.$$

17. Its adopted development is

$$F = dt^2 - dt'^2 + 2dt - 2dt' \frac{dt'}{dt}\,.$$

18. The wave always travels at c, free or confined.

19. Only at the end is

$$dt' \rightarrow 0, \qquad \frac{dt'}{dt} \rightarrow 0\,.$$

applied.

20. Then

$$F = dt^2 + 2dt\,.$$

21. The factorization is

$$F = 2dt(1 + \tfrac{1}{2}dt)\,.$$

22. The 1 / 2 does not come from Riemann.

23. In complex space the pair

$s_{\pm} = a \pm ib$.

is always preserved.

24. The stable points are discrete; not the whole line $\Re(s) = 1 / 2$ is stable.

25. In U_{Rim} the trivial zeros are separated from the nontrivial sector.

26. For the nontrivial sector,

$\rho_R = |\Re(z) - \frac{1}{2}|$.

27. The transverse coordinate is transported as

$\rho_{\text{VED}} = \rho_R$.

28. Stability is obtained from U_{VED} , not from Riemann.

29. If a supposed nontrivial zero had $\Re(z) \neq 1 / 2$, then it would have $\rho > 0$ and would belong to the non-stable complement.

30. By reduction to absurdity,

$\forall z \in Z^{\text{nt}}_{\text{Rim}}, \qquad \Re(z) = \frac{1}{2}$.

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22. Conclusion

The development begins in the geometry of the universe and not in the Riemann Hypothesis.

U_{VED} is obtained by representing wave closure through

$R_{\text{VED}} = \frac{n\lambda}{2\pi}$.

Its parametrization

$n = k \pm \rho$

is complete: k enumerates all closure families and $\rho \in [0, 1 / 2]$ runs through the whole interval from stability to maximum deviation. The stable states are all and

only

$$(k, 0), \qquad k \in N^{+} .$$

The precedent $U_{\mathrm{VED}} \cong U_{\mathrm{Sch}}$ proves within the framework that the same information can be represented through different topologies while preserving the state.

Differential geometry also produces the equation

$$F = (dt^2 - dt'^2) + \tfrac{d}{dt}(dt^2 - dt'^2),$$

which, preserving dt' until the proper limit of a wave at c is applied at the end, leads to

$$F = dt^2 + 2dt$$

and

$$F = 2dt(1 + \tfrac{1}{2}dt) .$$

The factor 1 / 2 therefore appears before introducing Riemann.

Finally, the nontrivial sector of U_{Rim} admits the transverse coordinate

$$\rho_R = |\Re(z) - \tfrac{1}{2}|,$$

which corresponds to the deviation ρ already defined in U_{VED} .

Since U_{VED} has proven that only $\rho = 0$ corresponds to stability and has exhaustively enumerated all stable states, a nontrivial zero with $\Re(z) \neq 1 / 2$ would imply $\rho > 0$, that is, a non-stable state, contradicting its belonging to the set of stable zeros.

Therefore,

$$\forall z \in Z^{\mathrm{nt}}_{\mathrm{Rim}}, \qquad \Re(z) = \tfrac{1}{2} .$$

Q.E.D.

Internal References of the Framework

- Document 7: *Gravity as a Geometric Relation of Radii*.
- Document 46 — Revision 3: immediately previous version of the present development.
- Einstein–VED / UNIHOLOG foundations.
- General DOI of the framework: `10.5281/zenodo.17172925`.