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Posted Date: 27 January 2026

doi: 10.20944/preprints202601.2055.v1

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Parity Symmetry Breaking in the 8×8 I-Ching Matrix: A Perspective on Cosmological Circulation

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Abstract

This paper explores the mathematical transition of a 64-gram (8×8) matrix system from static equilibrium to dynamic circulation. By applying a Riemann-inspired weight operator and a linear phase evolution governed by independent winding numbers k and m, we demonstrate how mirror symmetry is shattered. Drawing upon the theory of *Hyperbolic Bias*, we examine the evolution from $\delta = 0$ (Hermitian parity) to $\delta = 3/4$ (asymmetric dominance). This transition provides a formal mechanism for the transformation of "Obstruction" (Heaven-Earth) into "Full Circulation" (Earth-Heaven), establishing a mathematical analogue for the Sakharov conditions in Baryogenesis.

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1. Introduction

The quest to understand the fundamental asymmetry of the universe—specifically the dominance of matter over antimatter—remains a cornerstone of modern physics. In classical equilibrium states, perfect symmetry often implies stagnancy; for every constructive force, an equal destructive counterforce exists, resulting in a net-zero vacuum. However, ancient cosmological systems, such as the I Ching, and modern number theory, specifically the distribution of the Riemann Zeta zeros, suggest that reality is governed by a directional bias.

This paper proposes a synthesis of these domains by modeling the 64-gram (8×8) system as a complex matrix operator. We introduce a weight factor inspired by the Riemann Zeta function, defined by a parameter δ. We posit that as δ crosses the critical threshold of $1/2$, the system undergoes a geometric phase transition. By integrating the concept of Hyperbolic Bias, we demonstrate that stagnant states are mathematically filtered out, forcing a transition from the symmetric state of "Obstruction" to the dynamic state of "Full Circulation."

2. The Phase Basis and Topological Constants

We define an 8×8 complex matrix M where each entry (i, j) represents a hexagram interaction. The values are defined by:

$$M_{ij} = \left(\frac{1}{\sqrt{ij}}\right)^{l} \left(\frac{j}{i}\right)^{\delta} \omega^{k(i-1)-m(j-1)} \tag{1}$$

Where $\omega = e^{i\pi/4}$ represents the 8th root of unity. For the numerical models presented, we fix the topological winding numbers at $k = 1$ and $m = 1$. While these constants do not affect the absolute magnitude $|M_{ij}|$, they define the system's vorticity, ensuring the grid operates as a dynamic vortex. The **Hyperbolic Bias** emerges when evaluating the asymmetry between M_{ij} and M_{ji}. By defining $x = \ln(j/i)$, the transition potential T can be expressed as a function of the hyperbolic sine:

$$T(\delta) \propto \sinh(\delta x) \tag{2}$$

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This sinh term acts as a "Hyperbolic Lever." When $\delta = 0$, the lever is at rest ($T = 0$). As δ increases to $3/4$, the bias exponentially amplifies the preference for states where $j > i$ (Circulation) while suppressing states where $i > j$ (Obstruction).

3. The Unitary Phase Vacuum: Case $\delta = 0, l = 0$

In the primordial limit where $l = 0$ and $\delta = 0$, the magnitude $|M_{ij}|$ is uniformly unity. The interaction is governed by the discrete phase cocycle based on the 8th root of unity:

$$M_{ij} = \omega^{(i-j)} = e^{i\frac{\pi}{4}(i-j)} = \cos\left(\frac{\pi}{4}(i-j)\right) + i\sin\left(\frac{\pi}{4}(i-j)\right) \tag{3}$$

This configuration represents perfect CP symmetry where the matrix is Hermitian ($M_{ij} = \overline{M}_{ji}$).

Table 1. Complex Matrix M_{ij} for $l = 0, \delta = 0$ (Discrete Phase Basis $\pi/4$)

$i \downarrow, j \rightarrow$	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	1.00	$.71 - .71i$	$0 - 1.00i$	$-.71 - .71i$	-1.00	$-.71 + .71i$	$0 + 1.00i$	$.71 + .71i$
2	$.71 + .71i$	1.00	$.71 - .71i$	$0 - 1.00i$	$-.71 - .71i$	-1.00	$-.71 + .71i$	$0 + 1.00i$
3	$0 + 1.00i$	$.71 + .71i$	1.00	$.71 - .71i$	$0 - 1.00i$	$-.71 - .71i$	-1.00	$-.71 + .71i$
4	$-.71 + .71i$	$0 + 1.00i$	$.71 + .71i$	1.00	$.71 - .71i$	$0 - 1.00i$	$-.71 - .71i$	-1.00
5	-1.00	$-.71 + .71i$	$0 + 1.00i$	$.71 + .71i$	1.00	$.71 - .71i$	$0 - 1.00i$	$-.71 - .71i$
6	$-.71 - .71i$	-1.00	$-.71 + .71i$	$0 + 1.00i$	$.71 + .71i$	1.00	$.71 - .71i$	$0 - 1.00i$
7	$0 - 1.00i$	$-.71 - .71i$	-1.00	$-.71 + .71i$	$0 + 1.00i$	$.71 + .71i$	1.00	$.71 - .71i$
8	$.71 - .71i$	$0 - 1.00i$	$-.71 - .71i$	-1.00	$-.71 + .71i$	$0 + 1.00i$	$.71 + .71i$	1.00

4. Magnitude Evolution and Symmetry Breaking

4.1. Phase I: The Symmetric Limit ($l = 1, \delta = 0$)

At $\delta = 0$, the weight term reduces to unity, resulting in perfect magnitude parity $|M_{ij}| = |M_{ji}|$ with broken C symmetry.

Table 2. The Symmetric Mirror State at $\delta = 0$.

$i \downarrow, j \rightarrow$	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	1.000	0.707	0.577	0.500	0.447	0.408	0.378	**0.354**
2	0.707	0.500	0.408	0.354	0.316	0.289	0.267	0.250
3	0.577	0.408	0.333	0.289	0.258	0.236	0.218	0.204
4	0.500	0.354	0.289	0.250	0.224	0.204	0.189	0.177
5	0.447	0.316	0.258	0.224	0.200	0.183	0.169	0.158
6	0.408	0.289	0.236	0.204	0.183	0.167	0.154	0.144
7	0.378	0.267	0.218	0.189	0.169	0.154	0.143	0.134
8	**0.354**	0.250	0.204	0.177	0.158	0.144	0.134	0.125

4.2. Phase II: The Critical Break ($l = 1, \delta = 1/2$)

At $\delta = 1/2$, column influence vanishes, shattering mirror parity and C symmetry.

Table 3. The Critical Break at $\delta = 1/2$.

$i \downarrow, j \rightarrow$	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
2	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
3	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333
4	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
5	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
6	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.167
7	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143
8	**0.125**	0.125	0.125	0.125	0.125	0.125	0.125	0.125

4.3. Phase III: The Dominance Regime ($l = 1, \delta = 3/4$)

At $\delta = 3/4$, bottom-left stagnant states are exponentially suppressed with CP violation.

Table 4. The Dominance Regime at $\delta = 3/4$.

$i \downarrow, j \rightarrow$	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	1.000	1.189	1.316	1.414	1.495	1.565	1.627	**1.682**
2	0.420	0.500	0.553	0.595	0.629	0.658	0.684	0.707
3	0.253	0.301	0.333	0.358	0.379	0.396	0.412	0.426
4	0.177	0.210	0.233	0.250	0.264	0.277	0.288	0.297
5	0.134	0.160	0.177	0.190	0.201	0.210	0.218	0.226
6	0.107	0.127	0.141	0.151	0.160	0.167	0.174	0.180
7	0.088	0.105	0.116	0.125	0.132	0.138	0.143	0.148
8	**0.074**	0.088	0.098	0.105	0.111	0.116	0.121	0.125

5. Baryogenesis and Hyperbolic Bias

At $\delta = 3/4$, the magnitude ratio between $(1, 8)$ and $(8, 1)$ reaches ≈ 22.7. This massive suppression of the 'Obstruction' sector ($i > j$) relative to the 'Circulation' sector ($j > i$) constitutes a formal break of CP-symmetry, establishing the non-equilibrium condition necessary for a baryon-asymmetric universe. As established in [1], *Hyperbolic Bias* creates zones where zeros are geometrically excluded. In this matrix, the "Obstruction" sector is filtered out of the causal resonance, satisfying Sakharov conditions for matter dominance through C/CP-violation and non-equilibrium potential.

6. Conclusions

The transition from a symmetric $\delta = 0$ state to a biased $\delta = 3/4$ state within the 64-gram matrix provides a rigorous mathematical framework for understanding the emergence of dynamic order from static vacua. By applying the Riemann-inspired weight operator, we have demonstrated that symmetry breaking is not merely a physical event but a geometric necessity. The exclusion of "stagnant" states—analogous to the geometric exclusion of Riemann Zeta zeros—forces the system into a state of "Full Circulation." This model confirms that the cosmological arrow of time and the dominance of matter are encoded within the very structure of the 8×8 grid, bridging the gap between ancient metaphysical intuition and modern non-equilibrium theory.

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