

The Mirridian Dimensional Collapse Model

A Dyadic-Harmonic Framework up to $H = 15$

Abstract

We present a foundational formulation of the *Mirridian Dimensional Collapse Model*, a dyadic state-space framework in which dimensional structure arises through the restriction of accessible rotational degrees of freedom within a fixed, closed system. The model is developed explicitly and exclusively up to the $H = 15$ state space, corresponding to a $0 : 14$ dyadic shell with $N = 7$ paired degrees. Lower-dimensional regimes are shown to emerge as internal collapses of relational accessibility rather than as reductions in state count or extensions into higher-dimensional spaces. No assumptions are made beyond the justified $H = 15$ manifold.

1 Mirridian State-Space Convention

A Mirridian state space is defined as a bounded dyadic shell of the form

$$0 : 2N \left[\dots \right] 2N : 0$$

where all dyadic pairs satisfy an invariant total sum $2N$.

Each shell contains:

- N dyadic pairs $(k : 2N - k)$,
- a central fixed point $(N : N)$,
- exact closure with no implicit remainder.

Dimensionality in this framework does not correspond to spatial axes but to the number of *accessible relational rotations* within the shell.

2 The $H = 15$ Generative State Space

For $H = 15$, the system is bounded as

$$0 : 14 \left[1 : 13 \ 2 : 12 \ 3 : 11 \ 4 : 10 \ 5 : 9 \ 6 : 8 \ \mathbf{7 : 7} \ 8 : 6 \ 9 : 5 \ 10 : 4 \ 11 : 3 \ 12 : 2 \ 13 : 1 \right] 14 : 0$$

This shell contains $N = 7$ dyadic pairs and a central invariant $7 : 7$.

2.1 Octonionic Interpretation

The central dyad $7 : 7$ is not treated as primitive. Instead, it resolves internally as

$$7 : 7 \longrightarrow 7 + 1^*$$

where 1^* denotes a reciprocity or mirror scalar required for relational closure.

Under this interpretation:

- The $H = 15$ shell exhibits octonionic logic,
- Non-associativity is permitted,
- No traversal order is privileged,
- The state space is complete and closed.

This level represents the *maximal justified state space* of the present model.

3 First Collapse: $H = 15 \rightarrow H = 9$

The first dimensional collapse is defined as a restriction of relational access within the same state space, not as a truncation.

3.1 Collapse Mechanism

This collapse removes access to non-associative rotational structure, rendering one dyadic degree implicit while preserving state identity.

3.2 Resulting Shell

The resulting effective shell is

$$0 : 8 [1 : 7 \ 2 : 6 \ 3 : 5 \ 4 : 4 \ 5 : 3 \ 6 : 2 \ 7 : 1] 8 : 0$$

3.3 Quaternionic Regime

This regime is characterized by:

- Associativity,
- Stable rotational structure,
- Preservation of symmetry about $4 : 4$.

It constitutes the *experiential substrate*, though not yet observer-polarized.

4 Second Collapse: $H = 9 \rightarrow H = 5$

The second collapse introduces observer-relative asymmetry.

4.1 Polarization of the Central Dyad

The central dyad $4 : 4$ is not experienced symmetrically. It resolves as

$$(3 + 1^*) : (1 + 3^*)$$

where:

- 3 denotes extended spatial degrees,
- 1^* denotes a reciprocal temporal degree.

4.2 Resulting Shell

The polarized shell is

$$0 : 4 [1 : 3 \mathbf{2} : \mathbf{2} 3 : 1] 4 : 0$$

This level corresponds to experienced $3 + 1$ reality.

5 Interpretation of Dimensional Collapse

Dimensional collapse in the Mirridian model is defined as:

The restriction of accessible rotational degrees within a fixed dyadic state space, producing new invariant structures without introducing new states.

At no stage are entities added or removed; only relational accessibility changes.

6 Summary of Internal Regimes

Shell	Bounds	Algebraic Mode	Character
$H = 15$	$0 : 14$	Octonionic	Generative, non-associative
$H = 9$	$0 : 8$	Quaternionic	Associative, rotational
$H = 5$	$0 : 4$	Polarized quaternionic	$3 + 1$ experiential

7 Scope Limitation

No claims are made regarding:

- State spaces beyond $H = 15$,
- Physical constants,
- Cosmological structure,
- Empirical predictions.

The present document establishes only the internal logical structure of Mirridian dimensional collapse up to the justified $H = 15$ regime.

8 Conclusion

The Mirridian Dimensional Collapse Model provides a coherent dyadic framework in which dimensionality arises from internal restrictions on relational rotation rather than from spatial extension or additive degrees of freedom. All lower-dimensional regimes are shown to be quotient structures of the same closed $H = 15$ state space.