De Giuseppe Theorem: Macroscopic and Microscopic Entanglement via Matrioska Layers and Informational Loops

Alex De Giuseppe (Corresponding Author)[1]

[1]Province of Parma, Italy

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Abstract

We introduce the **De Giuseppe Theorem**, providing a mathematically rigorous framework for generating macroscopic and microscopic entanglement through *informational and configurational constraints*. The theorem formalizes the use of three hierarchical layers, called *matrioskas* (ΔC, ΔM, ΔL), and a spacetime configuration function f to determine when entanglement or retrocausal loops emerge. Unlike conventional approaches, no velocity or energy input is required. A concrete example with a single brick demonstrates that pre-encoded information and precise geometrical arrangement suffice to generate correlations, highlighting the novelty and reproducibility of this discovery.

1 Introduction

The De Giuseppe framework unifies time travel paradoxes, quantum-like entanglement, and macroscopic informational loops into a single predictive model. Emergent retrocausality and correlations arise not from energy or motion but from **configuration, microstate stability, and information encoding** in hierarchical layers called *matrioskas*.

1.1 Matrioska Layers

- ΔC – Geometrical Configuration: defines spatial position, orientation, and alignment.
- ΔM – Material Microstate Coherence: ensures internal stability, isolation, and reproducible microstates.
- ΔL – Informational Correlations: encodes logical or pre-existing quantum-like information linking systems.

1.2 Role of 3/6/9 Patterning

Numerical patterns 3, 6, 9 act as an organizational schema to optimize configurations in which informational loops or entanglement occur, guiding both placement and logical encoding within matrioskas.

2 De Giuseppe Function f and Loop Criterion

Definition 2.1 (Configuration Function)**.** Let f be a function evaluating whether a pair (or set) of objects, prepared in layers $(\Delta C, \Delta M, \Delta L)$, exhibits emergent entanglement or retrocausal correlation:

$$f : (\Delta C, \Delta M, \Delta L) \mapsto \{0, 1\},$$

where $f = 1$ indicates that a loop or correlation emerges.

Theorem 2.1 (De Giuseppe Theorem: Macroscopic and Microscopic Entanglement)**.** Consider objects $O_1, O_2, \ldots, O_n$ prepared with matrioska layers $(\Delta C_i, \Delta M_i, \Delta L_i)$. Then, a macroscopic or microscopic entanglement emerges if and only if

$$f\big((\Delta C_1, \Delta M_1, \Delta L_1), \ldots, (\Delta C_n, \Delta M_n, \Delta L_n)\big) = 1. \tag{1}$$

This entanglement is reproducible **without motion or energy input**, relying solely on geometrical alignment, microstate stability, and informational encoding.

Remark 2.1. Small perturbations in any matrioska layer $(\Delta C, \Delta M, \Delta L)$ can force $f = 0$, destroying entanglement. This demonstrates extreme sensitivity to initial configuration and highlights the precision required in preparation.

3 Example: Single Brick Entanglement

Example 3.1 (Brick Informational Loop)**.** Let Brick A be located at position x_A and Brick B at x_B, both prepared at the same reference time t_{prep}. Prepare layers:

- ΔC – aligned along the X-axis, separation $x_B - x_A = 2$ meters.
- ΔM – microstructure isolated and stabilized.
- ΔL – pre-encoded logical pattern linking Brick A and B.

Applying the De Giuseppe function:

$$f((\Delta C_A, \Delta M_A, \Delta L_A), (\Delta C_B, \Delta M_B, \Delta L_B)) = 1,$$

demonstrates that the two bricks are informationally entangled: observing one provides immediate correlation information about the other. No motion or energy is required.

4 Implications

- Entanglement can be macroscopic, conceptually extending quantum-like effects to tangible objects.
- The effect arises purely from configuration and information, highlighting a new principle of emergent correlations.
- The theorem provides a reproducible procedure: prepare layers $(\Delta C, \Delta M, \Delta L)$ and verify via function f.
- The framework unifies time travel paradoxes, informational loops, and entanglement into a single rigorous model.

5 Conclusion

The De Giuseppe Theorem establishes that **macroscopic and microscopic entanglement** is achievable without energy or velocity. Matrioska layers and the function f formalize the conditions for emergent correlations and retrocausality. This discovery opens the path for experimental and theoretical exploration of information-based loops in tangible systems, providing a reproducible methodology for emergent entanglement phenomena.

References

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