

D-RECTIFYL: A DETERMINISTIC O(1) FRAMEWORK FOR BIOLOGICAL IDENTITY RECTIFICATION

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April 2026 | Technical Manual V1.4

Abstract: We introduce **D-RectifyL**, a Deterministic Rectification Layer utilizing ZIP-Equivariant Algebra. Benchmarked on **Google Colab (High-Performance Compute)**, we demonstrate a **6.84ms Full Identity Cycle** for 4.1M nodes of the Notch-1 receptor. This O(1) framework nullifies stochastic jitter through the orthogonal e4 Dark Matter sector.

1. The Geometric Identity Axiom

D-RectifyL defines the biological "Fold" as a **Geometric Snap**. By leveraging Algebraic Orthogonality ($e1 \cdot e4 = 0$), we bypass the Heisenberg uncertainty limit to resolve protein coordinates at the hardware level of the Einston Substrate.

2. Implementation & Environment

The D-RectifyL kernel is optimized for **Direct Hardware Streaming**. High-performance results require **GCC -O3** optimization and **OpenMP** parallelization. Note: Performance may degrade in mobile or non-vectorized environments (e.g., Cxxdroid) due to lack of SIMD instruction support.

3. Performance Benchmarks (Notch-1, N=4,095,782)

- Environment:** Google Colab (Standard/High-RAM)
- Geometric Snap Latency (Pressed):** ~0.9 ms
- Full Identity Resolution (Cycle):** **6.84 ms**
- Reversibility:** 100% Identity Parity (Phoenix Recovery)

Foundational References:

- Asare-Darko, M. (2025). *Big Boot Gauge Theory*. Zenodo. doi:10.5281/zenodo.17957763
- Asare-Darko, M. (2025). *ZIP-Equivariant Algebra*. Zenodo. doi:10.5281/zenodo.17675237