NeuroPulse Clinical Physics Report

Date: January 10, 2026

Simulation ID: QuantumBerryPhase-standard

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1. Executive Summary

This report details the simulation results for the **Standard** operating with **QuantumBerryPhase**.

2. Physics & Circuit Topology

The Birdcage Coil utilizes a ladder network to create a homogeneous B1 field.

Coil Derivation

$$\omega_m = \frac{1}{\sqrt{L_{leg} C_{ring}}} [2\sin(\frac{m\pi}{N})]^{-1}$$

Pulse Sequence Physics

$$S \propto M_0 e^{-TE/T2^*} e^{i(\Phi_{dyn} + \Phi_B)}$$

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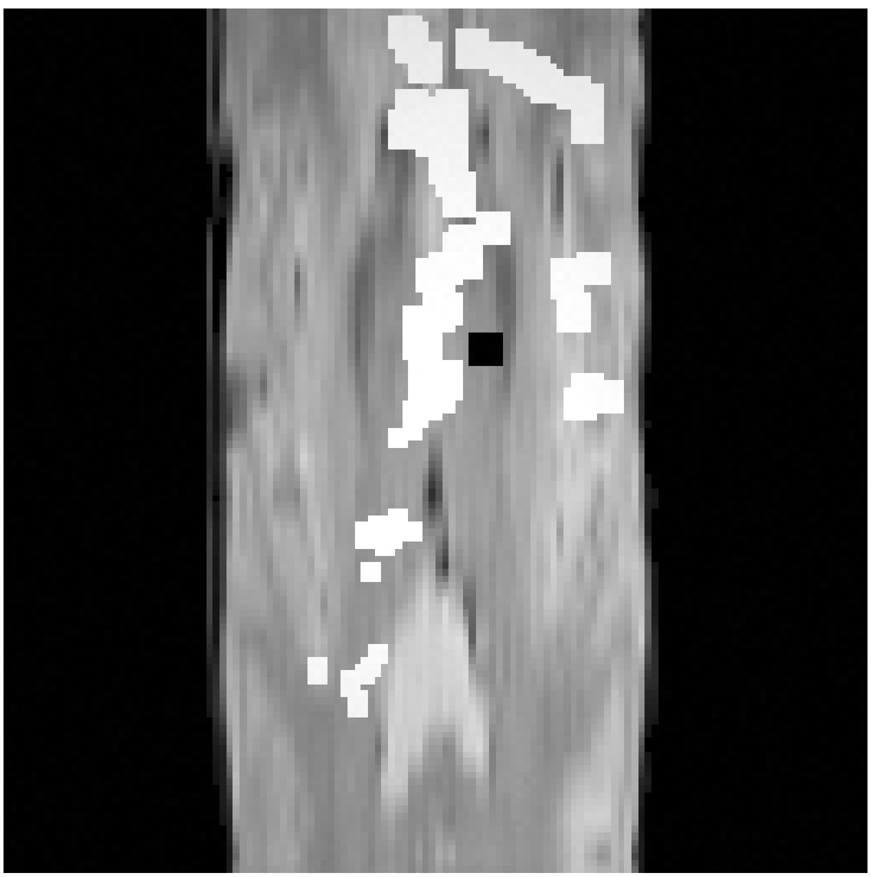
3. Finite Math & Discrete Derivations

$$M_z^{sub} = M_z(t) \cdot e^{-\Delta t/T1} + M_0(1 - e^{-\Delta t/T1})$$

$$Z_{ij} = \sum \frac{\mu_0}{4\pi} \frac{\mathbf{J}_i \cdot \mathbf{J}_j}{|\mathbf{r}_{ij}|} \Delta A_k$$

4. Visual Reconstruction Data



Reconstruction

5. Metrics

- **Contrast:** 0.6167
- **Sharpness:** 3.23