Title: Experimental Test of a Modified Delayed-Choice Quantum Eraser Configuration with Path Recombination (D5 Scheme)

Collaboration: Independent research proposal in collaboration with ELI-NP scientific staff (to be defined).

Author: [Your Name], Independent researcher, Mount Athos. Proposed spokesperson: [Your Name].

Scientific Case: The delayed-choice quantum eraser experiment shows that interference patterns only appear in coincidence measurements. This proposal investigates whether a modified configuration involving path recombination (D5 scheme) can affect the marginal distribution.

Scientific Problem: Can interference-like structures appear in the marginal distribution of idler photons without coincidence counting?

Aims and Objectives: Construct modified DCQE setup, measure distributions, compare with standard quantum predictions.

Methodology: SPDC photon generation using BBO crystal, separation of signal/idler photons, recombination of signal paths, detection on position-sensitive detector, statistical analysis.

Requested Beam: Low power coherent laser suitable for SPDC (e.g. 405 nm pump).

Targets: Nonlinear crystal (BBO), optical elements (beam splitters, mirrors, lenses).

Instrumentation: Single photon detectors (APD/SPAD), coincidence counting system, optical table, phase control elements.

Theoretical Support: Based on standard quantum optics formalism and extended DCQE model. Numerical simulations available.

Envisaged Results: Either confirmation of standard no-signalling predictions or observation of deviations requiring further study.

Risks: Decoherence, misalignment, detector noise. Mitigation: calibration, alignment, statistical averaging.

References: Kim et al. (DCQE), Lee Wen Wu (2021).