

Linear Optics Interferometry

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I. INTRODUCTION

Si-Hui can colour code things she adds like this
And Peter can do it like this
Let's add comments and questions like this

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II. MATHEMATICAL BACKGROUND

Mathematical representation for LO networks, and very basic background on quantum optics

III. OPTICAL ENCODING OF QUANTUM INFORMATION

A. Single-Photons

1. Polarisation
2. Dual-Rail
3. Time-Bins

B. Continuous-Variables

1. Coherent States
2. Squeezed States

IV. EFFICIENT CIRCUIT DECOMPOSITIONS OF LINEAR OPTICS NETWORKS

Discuss the Reck et al. decomposition

V. EXPERIMENTAL IMPLEMENTATION

A. State Preparation

1. Single-Photons
2. Bell Pairs
3. Coherent States
4. Squeezed States

B. Linear Optics Networks

1. Bulk Optics
2. Waveguides
3. Time-Bins

Discuss fibre-loop architecture

C. Measurement

1. Photodetection

Discuss number-resolved and bucket detectors, multiplexed detection, APDs, current micropillar detectors

2. Homodyning

VI. APPLICATIONS FOR LINEAR OPTICS INTERFEROMETRY

A. Linear Optics Quantum Computation

B. Boson-Sampling

C. Quantum Metrology

Discuss NOON states - Heisenberg limited

Discuss MORDOR scheme

D. Encrypted Quantum Computation

VII. STATE OF THE ART

Discuss where experiments are at at the moment

VIII. CONCLUSION

Acknowledgments