A Comparison of Boson Sampling and Quantum Circuits in Interferometry

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***Abstract*—Interferometers are devices which use light, or more generally superimposing waves, using interference to extract information. We propose a method by which quantum information can be obtained and used as a benchmark for quantum circuits, as well as modelling non-linear interferometers. We simulate these with traditional classical methods, then show quantum circuit variants, finally showing how these circuits can be used as benchmarks for qubit coherence.**

I. Introduction