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Accurate and Precise Characterization of Linear Optical Interferometers

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We combine single- and two-photon interference procedures for characterizing any multichannel passive linear optical interferometer accurately and precisely. Accuracy is achieved by accounting for systematic errors due to spatiotemporal and polarization mode mismatch and estimating those mismatch parameters through calibrating on one known beam splitter. Enhanced precision is achieved by curve fitting to measured quantities based on a Poissonian shot noise assumption, and we employ bootstrapping statistics to quantify the resultant degree of precision. We demonstrate the efficacy of our procedure via testing with simulations and then experimentally.

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