

Design and manufacturing of a beams splitter in chip to produce different quantum statistics

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The design and manufacturing of a linear waveguide and a Beam splitter (BS) in resin (Ip-Dip) with directly coupled optical fibers are shown. They were manufactured by two photon polymerization (in a Nanoscribe) over a fused silica substrate and cover with Loctite to fix the coupling with multimode optical fiber. Those waveguides were used to process individual photons coming from a SPDC (subpoissonian statistic), waiting for different statistics in every output port when controlling the transmission and reflection coefficients in the BS as shown in the numerical simulation. The statistics we are interested on are the poissonian and the one with noise of the $1/f$ type to contribute to the understanding of these statistics and, moreover, because its potential application in quantum cryptography protocols.

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