

Frequency bin entanglement using cross-polarized twin-photon frequency comb source

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Author(s): Kirthanaa Indumathi, Thomas L. Daugey, Amélie Piveteau, Luca Furfaro, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France); Johann Cussey, AUREA Technology (France); Yanne K. Chembo, Univ. of Maryland, College Park (United States); Jean-Marc Merolla, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

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We report a frequency bin entanglement experiment using a commercial cross-polarized of high brightness frequency entangled source combining with Inline Fabry Perot etalon at 1550 nm allowing the generation of cross-polarized frequency comb entangled photons. The two-photon Bessel interference patterns are produced in frequency domain using integrated modulation techniques. Visibility higher than 99% is observed using low loss detection method. The cross polarization makes possible a deterministic splitting of the twin photon. Our results participate to the demonstration that frequency-bin photon entanglement is a promising platform for the realization of various quantum information experiments in high dimension.