Quantum Physics

Clock synchronization by remote detection of correlated photon pairs

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We present an algorithm to detect the time and frequency difference of independent clocks based on observation of time-correlated photon pairs. This enables remote coincidence identification in entanglement-based quantum key distribution schemes without dedicated coincidence hardware, pulsed sources with a timing structure or very stable reference clocks. We discuss the method for typical operating conditions, and show that the requirement in reference clock accuracy can be relaxed by about 5 orders of magnitude in comparison with previous schemes.

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