

Interference between two independent photons for scalable quantum key distribution

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We demonstrate high-visibility Hong-Ou-Mandel (HOM) interference between two independent attenuated lasers, each probabilistically producing single photons at telecom wavelength (near 1550nm). By employing precise frequency locking, polarization alignment, intensity balancing, and temporal synchronization, we achieve visibility close to the theoretical limit of 50%. Our results are promising for achieving high key rates, enhanced security, and reduced QBER in measurement-device-independent (MDI) QKD, thereby enabling scalable quantum networks.

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