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[21p-E214-1~4]4.6 Quantum Optics and Nonlinear Optics

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△ : Presentation by Applicant for JSAP Young Scientists Presentation Award

▲ : English Presentation

▼ : Both of Above

No Mark : None of Above

1:15 PM - 1:45 PM

▲[21p-E214-1][INVITED] Recent progress in experimental quantum key distribution

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Keywords:Twin-Field Quantum Key Distribution

Quantum key distribution can provide information theoretical security, however channel loss seems to be the most severe limitation on the practical application of long distance quantum key distribution. The idea of twin-field quantum key distribution can improve the key rate from the linear scale of channel loss in the traditional decoy-state method to the square root scale of the channel transmittance. Here, we adopt the technology developed in the frequency and time methology field to lock two independent lasers' wavelengths and utilize additional phase reference light to estimate and compensate the fiber fluctuation. Further with a single photon detector with high detection rate, we demonstrate twin field quantum key distribution through the sending-or-not-sending protocol with realistic phase drift in 300 km optical fiber spools and beat the rate-distance limit.