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(57) Abstract :

The present invention discloses a reconfigurable quantum key distribution (QKD) system (100) architecture that utilizes a wavelength selective switch (WSS) (108) and entangled photons. The system (100) and method (200) enable the establishment of secure communication channels (104) and efficient distribution of cryptographic keys in modern communication networks (104). The reconfigurable QKD network (104) includes one or more network nodes (102) interconnected to form a secure communication network (104). Each network node (102) consists of a QKD unit, an entangled photon source, a detector, and a controller (106) for managing the QKD operations. The integration of wavelength selective switches and entangled photons in reconfigurable QKD networks (104) represents a significant advancement in the field of secure communication. The system (100) provides enhanced scalability, compatibility, and adaptability while ensuring the utmost security in key distribution.

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