Contribution ID : **116** Type : **presentation (QT PhD program student)**

Molecular Photons based Quantum Key Distribution at Room Temperature

venerdì 2 settembre 2022 18:35 (20)

Quantum key distribution (QKD) renders long-term solution for information-theoretic secure communication by exploiting basic laws of quantum physics. However, hardware imperfections limit unconditional security in QKD, for instance the presence of pulses containing multiple photons in BB84 protocol. Weak coherent pulses, defects in diamonds and quantum dots bases QKD is already under discussion but molecule-based single photon source for QKD haven't been reported to date. We present single molecules of polyaromatic hydrocarbons integrated in suitable hosts emitting narrow-band and indistinguishable single-photons at 785nm with high quantum efficiency. Proof-of-concept BB84 protocol employing single photons on demands at room temperature achieves secret key rate of 0.5 Mbps. Our molecular single photon source with high purity and scalable system operating at room temperature paves the way for future quantum cryptography.

Primary author(s) : Mr. MURTAZA, Ghulam (UNINA & National Optical Institute (CNR-INO))

Presenter(s) : Mr. MURTAZA, Ghulam (UNINA & National Optical Institute (CNR-INO))

Session Classification : Students Talks 3