

IQA (LTCI-Telecom Paris)

Activities on Quantum Networks



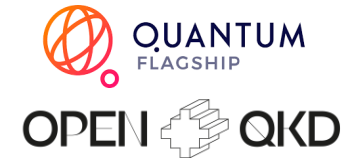
■ CIVIQ: Continuous Variable Quantum Communication

- *European Quantum Technology Flagship Project: 2018-2021*
Our activity: Quantum Coherent Communication System Development
(PIs: R. Alléaume, Y. Jaouen, C. Ware)



■ OpenQKD: European QKD Testbed

- *European Quantum Technology Flagship Project: 2019-2022*
- Our activity: QKD Implementation Security (PI: R. Alléaume)



■ EuroQCI: European Quantum Communication Infrastructure

- Project of **Pan-European Quantum Network** using **both terrestrial and space links by 2030**.
- Large Industry-driven consortium
- Our activity: Architecture and Security Services (PI: R. Alléaume)



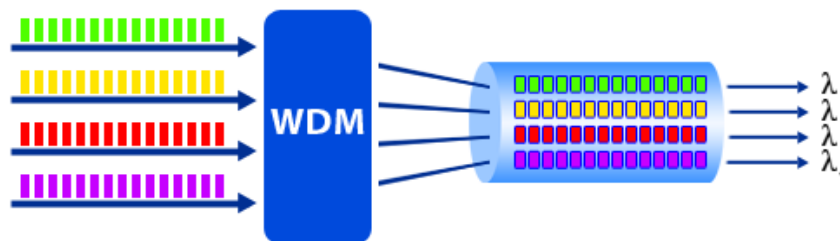
■ ParisRegionQCI

- Quantum Network between Paris, Chatillon (Orange Labs) and Telecom Paris
- Our activity : CV-QKD + Crypto (PI:s R. Alléaume, Y Jaouen)



Some research challenges: QKD at the classical frontier

Integration
with optical networks



Rupesh Kumar, Hao Qin, Romain Alléaume,
Coexistence of continuous variable QKD with intense DWDM classical channels. New Journal of Physics, 17(4), 043027. (2015).

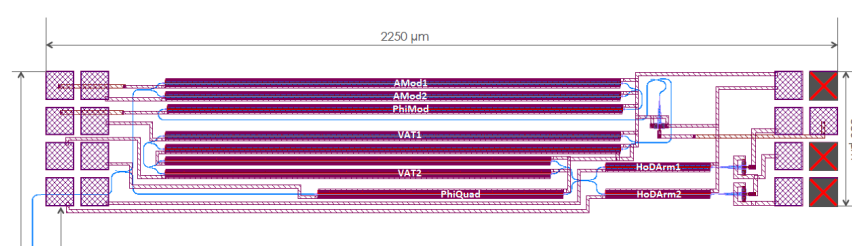
Implementation security



Hao Qin, Rupesh Kumar, and Romain Alléaume
Quantum hacking: Saturation attack on practical continuous-variable quantum key distribution, Phys. Rev. A 94, 012325. (2016)

Smaller and Cheaper systems

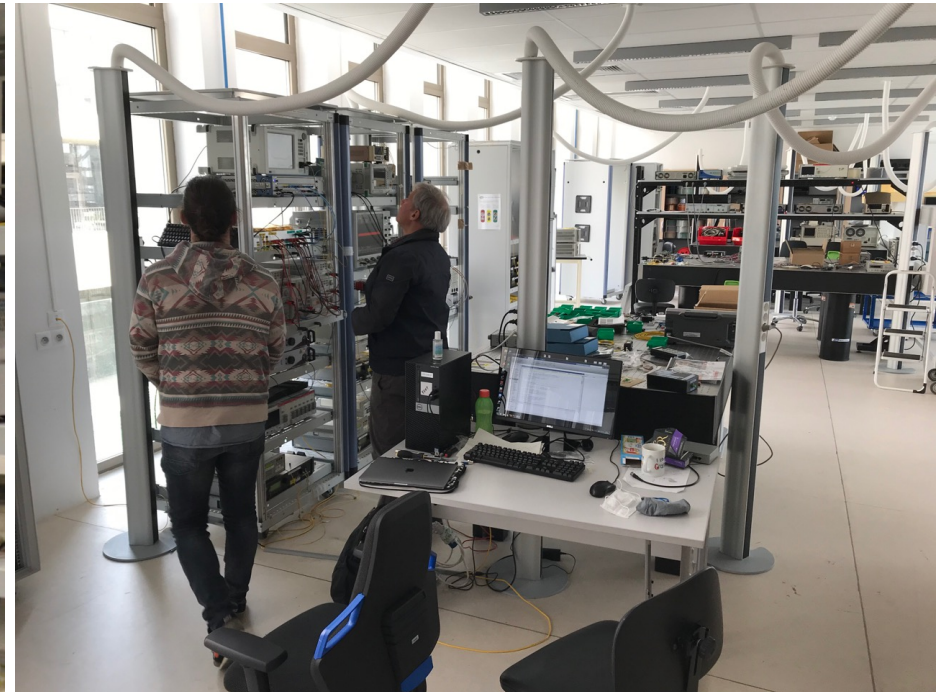
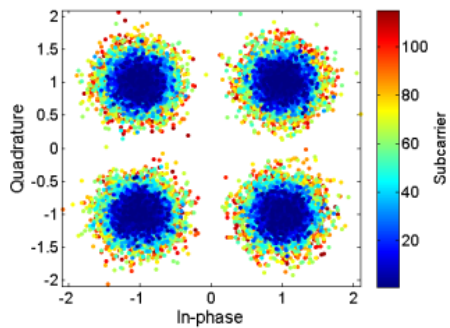
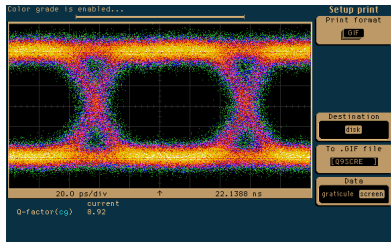
- Photonic integration
- Convergence with classical coherent comms



Courtesy
Eleni
Diamanti

Adrien Marie and Romain Alléaume
Self-coherent phase reference sharing for continuous-variable quantum key distribution Phys. Rev. A 95, 012316, (2017)

Q Communication over a state-of-the-art optical communication platform



Collaboration avec équipe GTO- Telecom Paris (Yves Jaouen, Cédric Ware)
Plateforme 40 Gb/s à l'état de l'art + détecteurs cohérents « quantiques »