

# Continuous Variable Quantum Key Distribution with Displaced Coherent State

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Convergence of CV-QKD into classical coherent detection schemes have recently been gained attraction due to many reason such as: to overcome the power constrains on generation and distribution of local oscillator from Alice; to avoid local oscillator targeted security attacks; to avoid cross talk between signal and local oscillator; etc. Local generation of Local Oscillator (LLO) at Bob have been proposed and experimentally demonstrated [1, 2] with distributed reference pulses. Displaced coherent sates can be used for distributing reference frame as well as signal for CV-QKD [3]. It is also proposed for hybrid quantum - classical protocol [4]. Here we test the feasibility of using displaced coherent states for CV-QKD in the case of distributed local oscillator setup which will be extended to LLO scheme in future. Displaced coherent states are generated in a Sagnac loop made around highly reflective beam splitter and quadratures are measured by homodyne detector. We will detail the experimental setup, method for extracting quadrature information and excess noise measurements results in the poster.

## References

- [1] Bing Qi *et al*, Phys. Rev. X 5, 041009
- [2] DBS Soh *et al*, Phys. Rev. X 5, 041010
- [3] <https://arxiv.org/pdf/1605.03642.pdf>
- [4] <https://arxiv.org/pdf/1606.02664.pdf>