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Robust Interior Point Methods for Quantum Key Rate Computation for Quantum Key Distribution

We derive a stable reformulation of the quantum key rate computation for finite dimensional quantum key distribution (QKD) problems. This avoids the difficulties from singularities that arise due to loss of positive definiteness. This allows for the derivation of an efficient Gauss-Newton Interior point approach. Empirical evidence illustrate the strength of this approach as we obtain high accuracy solutions and theoretically guaranteed upper and lower bounds for the quantum key rate.