Relationships of Quantum Noise Between Trusted Nodes in Quantum Networks

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Linear Paths Calculations

Calculating the total quantum noise across a linear series of trusted nodes.

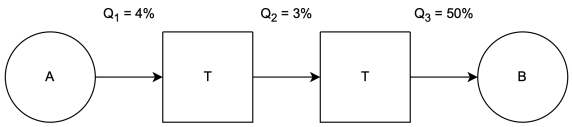

Figure 1: This represents a linear quantum network where data flows from user A to each ensuing T node, and eventually to B.

N corresponds to the total number of arcs, Q_i corresponds to the total noise at arc i, and Q_t represents the total quantum noise in system. Equation 1

$$1 - \prod_{i=0}^{N}(1 - Q_i) = Q_t \tag{1}$$

Example 1

Using the numbers provided in Figure 1, we can test Equation 1.

1. 1-(Q_0) = 1-.04 = .96
2. .96 * (1-(Q_1) = 1-.03 = .97) = .97*.96 = .9312
3. .9312 * (1-(Q_2) = 1-.5 = .5) = .9312 * .5 = .4656