From classical to good quantum LDPC codes.

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Today.

- Brif Review of Coding.

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- Brif Review of Coding. Tanner and Expander codes.

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- Quantum Error Correction Codes.

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- Quantum Error Correction Codes.
- Good Classical Locally Testabile Codes and Good Qauntum LDPC.

Classical Vs Quantum Encoding.

Classical:

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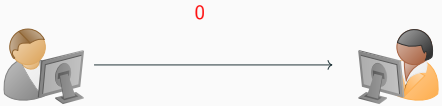
Classical:



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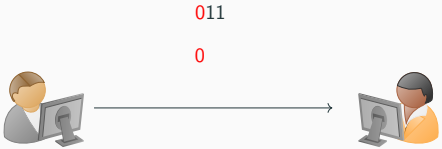

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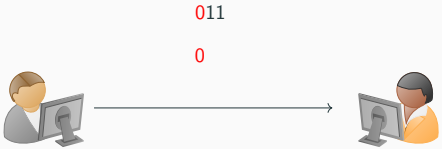

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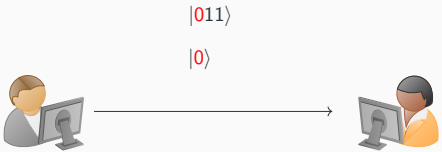

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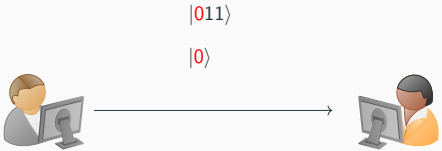
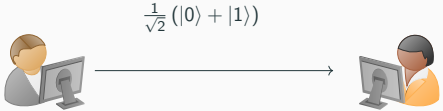


Quantum:



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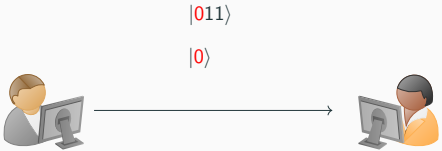

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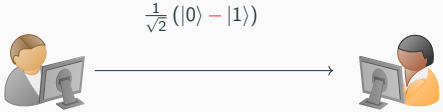

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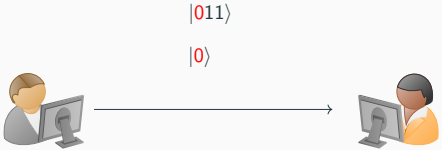

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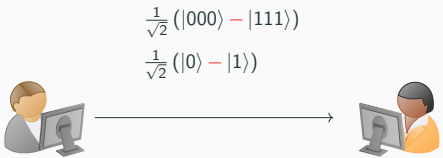

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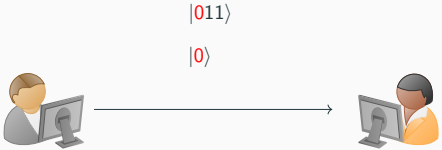

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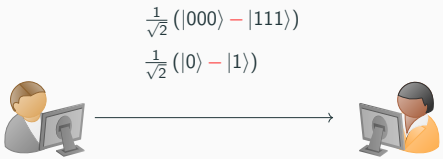

The C.S Questions.

In the asymptotic regime, can we encode quantum states in codes robust against many errors, as the our original massage grows? And in what costs?

Good Classical LDPC Code.

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Quantum Encoding.

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Quantum Encoding.

Idea I - (Uncertainty) Clouds as States.

CSS Code.

'Idea II' - Tanner Checks are 'Too Much' Interdependence.

'Idea III' - Impossibility of Both C_X, C_Z being Good.

Quantum Tanner Code Construction.

Proving Strategy.