

# From classical to good quantum LDPC codes.

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# Today.

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- Brif Review of Coding.

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- Brif Review of Coding. Tanner and Expander codes.

# Today.

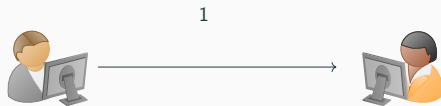
- Brief Review of Coding. Tanner and Expander codes.
- Quantum Error Correction Codes.

# Today.

- Brief Review of Coding. Tanner and Expander codes.
- Quantum Error Correction Codes.
- Good Classical Locally Testable Codes and Good Quantum LDPC.

# Classical Vs Quantum Encoding.

Classical:

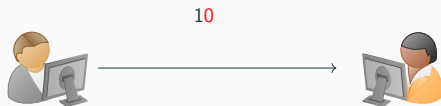


Quantum:



# Classical Vs Quantum Encoding.

Classical:

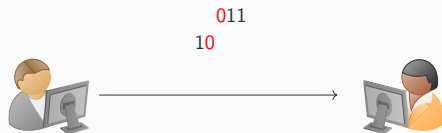


Quantum:



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Classical:



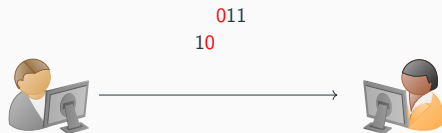
Quantum:





# Classical Vs Quantum Encoding.

Classical:

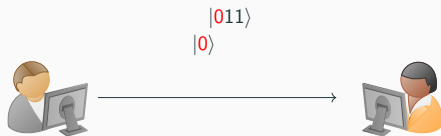


Quantum:



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Classical:

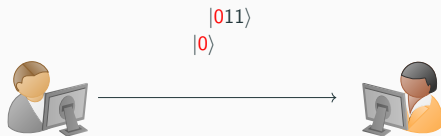


Quantum:

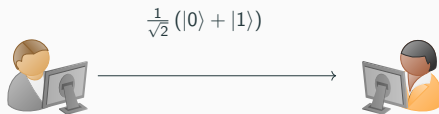


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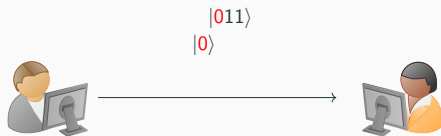


Quantum:

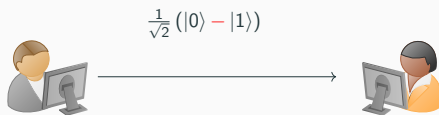


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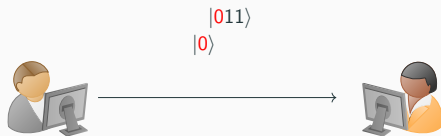


Quantum:

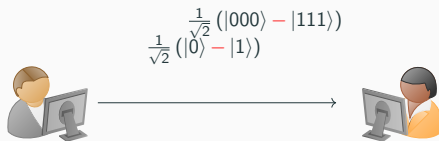


# Classical Vs Quantum Encoding.

Classical:



Quantum:



## Good Classical LDPC Code.

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## Good Classical LDPC Code.







## Idea I - (Uncertainty) Clouds as States.

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

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



# Quantum Tanner Code Construction.

