

Phys 523B: Fault tolerant quantum computation

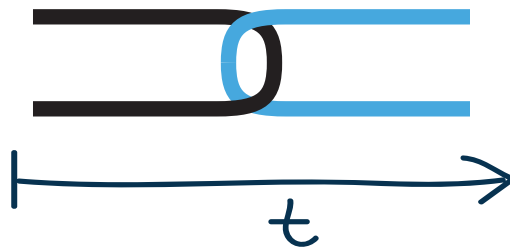
Homework 4

Posted: Monday, March 27, 2021 • Due: Tuesday, April 6, 2021, 6PM.

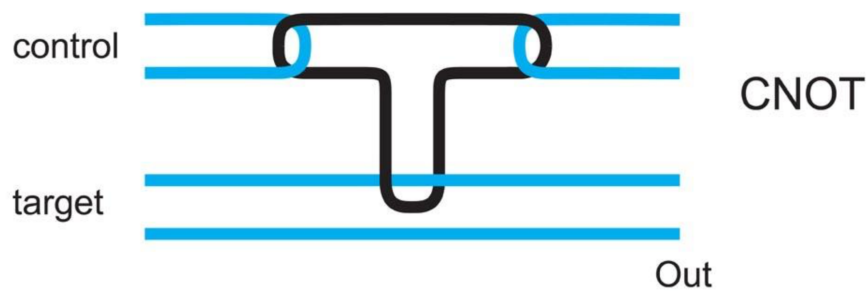
Please email your scanned or typeset assignment solutions to the TA Xiruo Yan: xyan@phas.ubc.ca

Both problems on this assignment refer to implementing topological gates in the surface codes; cf. Lectures 18 and 19.

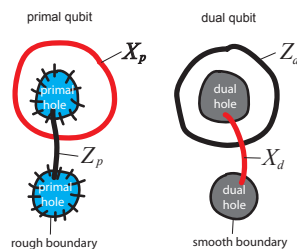
Problem 1. (5 points): What does this topological diagram represent? Justify your answer.



Problem 2. (5 points): Show that the topological diagram below realizes a CNOT gate. Do this by reproducing the conjugation relations for Pauli operators under a CNOT gate.



Both problems refer to the encoding



Total: 10 points.