

The diagram illustrates a quantum circuit for a 2-qubit system. The initial state is $(10)(2e)$. The circuit consists of the following layers of operations:

- Layer 1:** A CNOT gate with qubit 1 as the control and qubit 2 as the target, followed by a Hadamard gate on qubit 1.
- Layer 2:** A CNOT gate with qubit 2 as the control and qubit 1 as the target, followed by a Hadamard gate on qubit 2.
- Layer 3:** A CNOT gate with qubit 1 as the control and qubit 2 as the target, followed by a Hadamard gate on qubit 1.
- Layer 4:** A CNOT gate with qubit 2 as the control and qubit 1 as the target, followed by a Hadamard gate on qubit 2.

The final output of the circuit is labeled "Dubbel".