Qiskit exercise

March 7, 2024

1 Simulate a two-qubit protocol in IBM Qiskit Lab

Task:

1. Prepare a pair of noisy input state $\psi_0 =$ Normalize($|00> + a * |11>$), where a is small. I recommend to create the input state as an ideal Bell state but apply an extra RZGate on the control qubit considered as the noise model.
2. Create the circuit as seen in the figure bellow. (Choose qubit indices carefully.)
3. Instead of performing with conditional measurement, it is easier to make post-selection at the end. Consider a single iteration.
4. Run/execute on a simulator e.q. qasm or aer. Post-select "00" and "11" results simultaneously.
5. Plot the counts of the post-selected measurements.

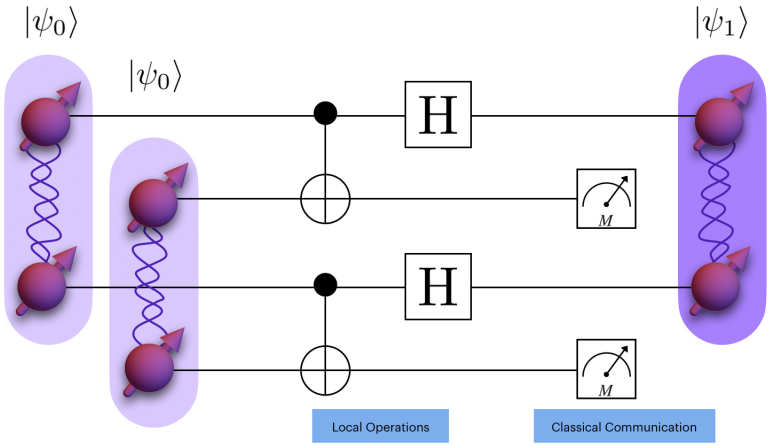

Figure 1: 2-qubit protocol