Contribution ID: **49** Type: **Poster**

Multiplexing of the Transport Through an X-Junction Ion Trap

Monday 8 July 2024 17:02 (2 minutes)

When scaling up ion trap quantum processors the wiring of the large number of necessary control signals becomes a problem.
We present a concept for reducing the amount of control signals needed for the transport through the X-junction of a surface electrode ion trap. By using switching electronics, the signals are multiplexed and enable the control of multiple electrodes per incoming signal and therefore reducing the total amount. The key issues are finding the minimum number of signals that still allow the transport through the junction and the appropriate attribution of electrodes to the signals.

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Session Classification: Poster session

Track Classification: Quantum Information & Computing