Contribution ID: **194** Type: **Talk**

【407】Towards scalable quantum operations on mixed-species ion chains

Thursday 30 June 2022 15:45 (15 minutes)

Quantum computers require scalability as a key ingredient in order to perform complex and reliable calculations. A promising platform is the so called QCCD architecture, in which ion traps have multiple zones dedicated to specific quantum operations. In this perspective, I will describe work performed on a Paul trap which improves the control over multiple species ion crystals, including static confinement, shuttling through different zones, splitting crystals into smaller units and vice versa. These improvements naturally led to investigate new experimental regimes, in which different ion vibrational modes intersect and couple with a tunable strength.

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Session Classification: Atomic Physics and Quantum Optics

Track Classification: Atomic Physics and Quantum Optics