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# Entanglement between remote ions interfaced with cavities

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In a quantum network, entanglement between qubits located in remote nodes is a fundamental resource for different applications including distributed quantum computing and quantum repeaters. Once can generate entanglement between distant ions by creating an ion-photon entangled pair at each of the two network nodes, steering the photons to opposite ports of a beamsplitter, and subsequently detect them. Specific photon detection patterns herald the generation of the ion-ion entangled state. Two remote ions have previously been entangled over a separation of a few meters. Here, we present entanglement generation between ions stored in remote nodes in separate buildings in Innsbruck, connected via a fiber link of 400 m, where the trapped ions are interfaced with optical cavities.

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