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【567】Integrating a fiber cavity along the axis of a linear ion trap

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Interfaces between stationary and traveling qubits are fundamental building blocks for quantum networks. Cavities are an established approach for an efficient interface; here, we use a fiber cavity to couple trapped ions to photons. Fiber cavities enable access to the strong coupling regime, allowing quantum communication to be carried out over long distances with high fidelity and efficiency. To couple multiple ions, we have designed an ion-cavity system in which fibers are integrated inside electrodes along the axis of a linear Paul trap. As an intermediate step, we have measured heating rates and micromotion of our trap in the absence of fibers. After reassembling the trap with the fiber cavity, we are currently characterizing the full system.

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