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An ion trap with integrated metal-clad fiber microcavity

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We designed an ion trap with integrated fiber cavities for enhanced coupling between single ion and photons. We fabricated the fiber electrodes covered with metal except for the light-through region by a series of processes including etching, CO₂ laser ablation, lithography, magnetron sputtering, stripping, and electroplating. Its metallic part can be used both to provide the voltage required to trap the ion and to conduct the charge generated during UV photoionization. We simulated the trapping potential and built a validation device with similar structure. We have now successfully captured $^{138}\text{Ba}^+$ ion using the validation device.

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