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Fiber optic laser delivery system for planar ion traps ELIZABETH GEORGE, DAVID LEIBRANDT, ISAAC CHUANG, MIT — The use of trapped ions for quantum computation requires precise focusing and alignment of lasers for cooling the ions and performing logic gates. On-trap fiber optics would eliminate the need for alignment of lasers to the traps and allow scaling of surface-electrode ion traps on large chips to smaller sizes. We have developed a design for implementing on-trap fiber optics with an integrated beam focusing lens using microfabrication techniques. The design uses SU-8 photoresist structures to align the fiber and focusing lens to the trap. We present details of the design and the results of preliminary testing.

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