

Abstract Submitted  
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**Toward Cavity QED on an atom chip** THOMAS PURDY, DAN STAMPER-KURN, Department of Physics, University of California Berkeley — We describe the construction and operation of microfabricated atom chips containing optical cavities suitable for cavity QED. The silicon or sapphire chips support microfabricated magnetic traps and guides for ultracold atoms, as well as Fabry-Perot optical cavities with axes perpendicular to the chips' surface. In the case of the sapphire chip, the cavities are half planar with the flat mirrors deposited directly on the surface of the chip, and curved macroscopic mirrors mounted above the chip. The silicon chip has micromachined holes through which the modes of externally mounted Fabry-Perot cavities pass. The cavities have small enough mode volume and high enough finesse to be useful as atom number detectors in a variety of on-chip experiments. Also this technology may be used in a number of cavity QED based quantum optics schemes, which would benefit from controllable magnetic loading of cold atoms into optical cavities.

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