Abstract Submitted
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Progress toward a chipscale MOT[1] KAITLIN MOORE, NIST Boulder, JAMES MCGILLIGAN, 1) University of Colorado 2) NIST Boulder, RODOLPHE BOUDOT, 1) FEMTO-ST, CNRS, France 2) NIST Boulder, JOHN KITCHING, NIST Boulder — We report on progress toward forming a magneto-optical trap (MOT) in a passively-pumped, chipscale MEMS-fabricable package. This work is an essential step in integrating cold atoms into mass-producible, portable instruments[2,3]. One major challenge is preserving ultra-high vacuum levels in anodically-bonded MEMS cells without the use of an active pump. Ultra-high vacuum levels are critical to forming a vapor-loaded MOT[4,5] and attaining commercially-relevant cell lifetimes. Here, we report on experimentally-tested solutions to mitigating gas evolution in the 1-cc-volume MEMS cell during and after the fabrication process, as well as controlling rubidium-vapor content. We report on testing performed in our actively-pumped MEMS-cell MOT systems and outline remaining steps toward achieving a true chipscale MOT.

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Kaitlin Moore
National Institute of Standards and Technology Boulder

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