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A miniature mechanical shutter for atomic beams STEPHANIE MILLER, DAVID ANDERSON, ANDREW CADOTTE, GEORG RAITHEL, University of Michigan — In many atomic physics experiments, atomic beams are generated for transport of atoms from a region of high (HV) to ultra-high vacuum (UHV). In such experiments, as well as those requiring a large number of atoms, it is desirable to load an atomic trap by a high flux source, such as a pyramidal magneto-optic trap (MOT) or Zeeman slower, without having the trap be affected by the atomic beam once loading is completed and subsequent experimental steps are initiated. We present here a mechanical shutter intended for this purpose in a BEC experiment. By implementing the shutter, we hope to block not only the beam, but other gases from entering the main chamber, resulting in improved evaporative cooling efficiency, which in turn will allow us to form BECs more quickly and easily. The shutter design discussed in detail here is unique in its small size (less than 5 mm in diameter, encompassing a magnet, steel rod, solenoid, and mu metal for magnetic shielding) and UHV compatibility. Performance parameters of the shuttering mechanism are also presented.

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