

Abstract Submitted
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Large-Angle Deflection of MOT-Based Cold Cs Beam by Optical Molasses H. WANG¹, G. IYANU, The Aerospace Corporation — We have generated a slow moving Cs atomic beam from a vapor-cell Cs MOT and deflected the cold Cs beam by an angle of 30 degrees using a 1-D optical molasses. The MOT-generated Cs atomic beam travels at a mean velocity of 7 m/s with a velocity spread of 1 m/s. At 18 cm down-stream from the Cs MOT, the Cs atomic beam interacts with a 1-D optical molasses formed by a pair of frequency-stabilized, retro-reflected laser beams. The 1-D optical molasses is set up in such a way that the molasses laser beams are perpendicular to the final atomic beam propagation path. Thus, the Cs beam velocity components along the molasses axis are efficiently damped to nearly zero, while the velocity component along the final atomic beam propagation path is unaffected. In a probe region about 34 cm down-stream from the optical molasses, laser induced fluorescence of the deflected Cs beam is obtained and used for studies of the atomic beam deflection efficiencies and beam manipulation parameters. This deflected Cs atomic beam will be used in our cold Cs beam atomic clock experiment. This work was supported under The Aerospace Corporation's Mission Oriented Investigation and Experimentation program, funded by the U.S. Air Force Space and Missile Systems Center under Contract No. FA8802-04-C-0001.

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