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Building a magneto-optical trap with millimeter ball lenses MICHAEL VIRAY, LEO NOFS, Univ of Michigan - Ann Arbor, CAINAN NICHOLS, ERIC PARADIS, Eastern Michigan University, GEORG RAITHEL, Univ of Michigan - Ann Arbor — Since the development of the first magneto-optical trap (MOT), multiple researchers have successfully created alternative MOT configurations. These MOT configurations (e.g. grating MOTs, pyramidal MOTs) rely on the same physical principles as the original design, but they are also usually designed to achieve a specific goal such as miniaturization or single-beam MOT formation. We report on the development of a MOT that utilizes millimeter ball lenses to expand narrow beams into divergent light cones for atom trapping. We present a computational model of the ball lens MOT, construction details of the Ball Lens Optical Box (BLOB), and experimental and computational results for this MOT. We discuss advantages of this new design and plans for future implementation.

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