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Atom interferometry using Kapitza-Dirac scattering DAVID ANDERSON, RACHEL SAPIRO, University of Michigan, RUI ZHANG, Harvard University, GEORG RAITHEL, University of Michigan — We demonstrate two atom interferometric schemes based on Kapitza-Dirac scattering in a magnetic trap. In the first method, two Kapitza-Dirac scattering pulses are applied with a small time delay between them. High contrast interference is observed both using a thermal cloud and a Bose-Einstein condensate (BEC). In the second method, two Kapitza-Dirac scattering pulses are applied to a BEC with a time separation sufficiently large that the interfering orders complete half an oscillation in the magnetic trap; this enables interferometry between spatially separated paths. We also review related lattice experiments performed using the same setup.

David Anderson
University of Michigan

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