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Experiments with Ultra-cold Atoms in an Optical Lattice with Dynamically Variable Lattice Constant JOHN HUCKANS, IAN SPIELMAN, BRUNO LABURTHE TOLRA, Institut Galile - Universit Paris 13, J.V. PORTO, W.D. PHILLIPS, LASER COOLING AND TRAPPING TEAM — We have implemented a one-dimensional optical lattice whose periodicity may be dynamically varied with ultra-cold atoms in-situ. We have measured atom heating rates in the lattice as a function of lattice periodicity ramp velocities and profiles. We superimpose another one-dimensional lattice with fixed periodicity and measure atom diffraction as a function of the ratio of the two competing periodicities. Finally, we report interesting near field atomic diffraction results for extremely large periodicity lattices.

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