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Crystal Atom Optics: Helium on Lithium Fluoride ADAM LIBSON, CHRISTOPH SCHAEFF, GENEVA WHITE, MARK RAIZEN, Department of Physics and Center for Nonlinear Dynamics, The University of Texas at Austin — We report progress on our experiments reflecting Helium from Lithium Fluoride (LiF). We have undertaken a systematic study of the production of atomically flat single crystal LiF surfaces, which are produced by cleaving the crystal. The flatness of the cleaved surface depends on the defect density in the crystal, which we produce via varying doses of gamma irradiation. We measure the flatness via atomic force microscopy, and correlate these results with the reflected intensity of the beam from the crystal. Matter wave effects, such as diffraction of the beam from the crystal surface, will be discussed.

Adam Libson
Department of Physics and Center for Nonlinear Dynamics,
The University of Texas at Austin

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