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Interactions of cold rubidium atoms with a magnetic reflector TIMOTHY ROACH, KATELYN CANDEE, College of the Holy Cross — We report on experiments on the scattering of cold Rb atoms from a sub-micron patterned permanent magnet made from a Zip disk. The atomic source is a magneto-optic trap. The locally strong, periodic magnetic field of the disk should reflect and diffract the atomic waves, provided the atoms in weak-seeking states adiabatically follow the field. Non-uniformity of the magnetic pattern and of the physical surface result in diffuse scattering and loss to state-changing transitions. We present results from the study of several controllable factors, including the initial atomic cloud temperature and size, and the strength and direction of a weak uniform magnetic field for preserving orientation.

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