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Microwave Induced Diffraction of Matter Waves from an Optical Lattice[1] JEREMY REEVES, MIKE STEWART, LUDWIG KRINNER, ARTURO PAZMINO, DOMINIK SCHNEBLE, Stony Brook University — We demonstrate a novel type of Kaptiza-Dirac diffraction of matter waves from a microwave-dressed optical lattice. In our experiment, coherent momentum transfer is driven by internal-state coupling of a BEC to a single orbital of a state-dependent optical lattice. We analyze the internal and external dynamics of the diffraction process and characterize the matter-wave interference using a pump-probe scheme. Possible applications of our scheme will be discussed.

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