

Abstract Submitted  
for the DAMOP06 Meeting of  
The American Physical Society

**Diffraction of 0.5 keV electrons from free-standing transmission gratings** BEN MCMORRAN, JOHN PERREAULT, University of Arizona, TIM SAVAS, Massachusetts Institute of Technology, ALEX CRONIN, University of Arizona — A nanostructured grating was used to diffract a low-energy (500 eV) electron beam, and the current transmitted into the zeroth diffraction order was greater than 5% of the incident beam current. This diffraction efficiency indicates that the 55-nm-wide grating bars absorb electrons but the 45-nm-wide slots between bars transmit electron de Broglie waves coherently. The diffraction patterns can be asymmetric, and can be explained by a model that incorporates an electrostatic potential energy for electrons within 20 nm of the grating structure calculated by the method of images.

Ben McMorran  
University of Arizona

Date submitted: 27 Jan 2006

Electronic form version 1.4