Abstract Submitted
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Nano-Fabricated Gratings for Electrons GLEN GRONNIGER, BRETT BARWICK, Department of Physics and Astronomy, University of Nebraska-Lincoln, TIM SAVAS, Research Laboratory of Electronics, Massachusetts Institute of Technology, HERMAN BATELAAN, Department of Physics and Astronomy, University of Nebraska-Lincoln — We explore the lower energy range for electron diffraction from a Au and Pd coated nano-fabricated transmission grating. This has the promise of providing a route to the lowest energy electron interferometer currently possible. Starting at 1000 eV we get well resolved diffraction peaks. As 60 eV electron energy is approached the diffraction peaks broaden to the extent that they are hard to resolve. We attribute this to an effective loss of transverse coherence length. We show that the broadening and coherence loss can be modeled with a path integral calculation where the essential ingredient is a random spatially varying potential with a typical length scale of 200 nm. The effect of other coatings, such as Ni, is investigated and indicates that lower electron energies can be reached. Work supported by NSF, DOD-EPSCoR.

Glen Gronniger
Department of Physics and Astronomy, University of Nebraska-Lincoln

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