

Abstract Submitted
for the NWS09 Meeting of
The American Physical Society

New Technique to Make Biprism for Electron Holography¹

AZADEH AKHTARI-ZAVAREH, KAREN L. KAVANAGH, Dep of Phys, SFU, RODNEY A. HERRING, Dep of Mechanical Engineering UVIC, RICKY CHU COLLABORATION — Electron holography is based on the formation of interference patterns using a coherent electron source. In most TEM imaging modes the final recorded image is a spatial distribution of intensity and all of the phase information is lost. Like optical holography to make a hologram at least two waves, the reference wave and the object one are needed. A biprism is a narrow wire put in the path of the electron beam with an applied electric field. The beam is split into two coherent beams one of them passing through the sample. There are different techniques for making a biprism. The first method still commonly used today is a silica filament covered with a Au or Pt layer. Since a smaller biprism diameter results in wider phase information, efforts have been aimed at reducing the glass filament diameters. We have found that glass biprisms are prone to contamination, subsequent charging, and fracture in the TEM. We are therefore working on making biprisms using alternative approaches including focussed Ga ion beam milling and by microfabrication techniques. We have patterned a set of wires with different diameters on a silicon nitride wafer by e-beam lithography followed by evaporation of Cr/Pt. Their properties will be compared to the conventional metal coated glass and ones made via the FIB.

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Date submitted: 17 Apr 2009

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