Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Investigation of electron beam induced changes in glassy Ge_xSe_{1-x} thin films[1] W. ZHOU, G. HOFFMAN, H.O. COLIJN, R.M. REANO, R. SOORYAKUMAR, The Ohio State University, P. BOOLCHAND, University of Cincinnati — Global structures in network glasses are characterized by their connectedness or mean co-ordination number. As the number of these cross-links within a covalent network increases by compositional tuning these systems steadily evolve from being underconstrained (floppy) to an overconstrained (rigid) solid. Recently (Appl Phys Lett 93, 041107 (2008)) we exploited electron beams to write nanoscale surface motifs in $Ge_{0.2}Se_{0.8}$ thin films that are at the special Ge in Se composition lying in the immediate vicinity of the floppy to rigid stiffness transition. In order to investigate the nature of the surface reliefs we have employed selected area transmission electron microscopy (TEM) to probe the electron beam induced structural changes to the film. Films of thicknesses less than 150 nm were deposited by pulsed laser deposition directly onto a carbon film on a mica substrate. The glass film and carbon layer were then lifted off onto copper grids for the TEM studies. Extension of the electron beam driven studies to other compositions, as well as the effect of multiple beam overwrites on the surface reliefs and trenches in several Ge_xSe_{1-x} compositions will also be presented.

[1]Supported by NSF through Grant No. ECCS 0701686.

W. Zhou
The Ohio State University

Date submitted: 23 Nov 2008 Electronic form version 1.4