Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Collective Mass Transport in Ag/Ge(110) 1D Nanoisland Growth[1] SHIRLEY CHIANG, CORY MULLET[2], University of California Davis, MICHAEL TRINGIDES, Iowa State University and Ames Lab-USDOE, MARSHALL VAN ZIJLL, BRET STENGER, EMILIE HUFFMAN[3], DYLAN LOVINGER[4], University of California Davis — The growth of Ag deposited on Ge(110) was studied with low energy electron microscopy (LEEM) and scanning tunneling microscopy (STM). The LEEM studies showed the formation of long one-dimensional (1D) multi-height islands over the temperature range 430C-530C. During deposition, the length of the islands increases at a constant rate ($\sim$ 106 atoms/sec reaching $\sim$ 20 microns) and constant width (100-200nm) for 9ML total deposition. Stochastic diffusion cannot account for these very high island growth rates. Similarly when island decay is observed, it happens exceedingly fast and cannot be explained by uncorrelated detachment of Ag atoms. Both processes indicate a more collective mass transport, which must be related to the mobility of the wetting layer. STM images show the crystalline structure of the 1D Ag islands and also that the reconstructed regions between the islands consist of bare Ge; thus they confirm that the wetting layer provides the material for the islands to grow at these high rates.

[1]Funded by NSF CHE-0719504, NSF PHY-1004848, and USDOE Contract DE-AC02-07CH11358
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Date submitted: 15 Nov 2013 Electronic form version 1.4