

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Iso-coverage diffusion zones observed with LEEM during annealing of Ag on Si(001)¹ KELLY ROOS, Department of Physics, Bradley University, KIMBERLY ROOS, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, FRANK MEYER ZU HERINGDORF, MICHAEL HORN-VON HOEGEN, Institute for Experimental Physics, University of Duisburg-Essen, JOACHIM KRUG, Institute for Theoretical Physics, University of Cologne — During high temperature annealing of 3D Ag islands grown on Si(001) PEEM images reveal the emergence of a bright zone surrounding the decaying islands. Microdiffraction patterns from these bright areas display a (2x3) Ag reconstruction. The decaying Ag islands act as sources of Ag adatoms which then diffuse on the surface. The (2x3) reconstruction spreads away from the island to a distance determined by the interplay of diffusion and desorption, and by the local coverage of Ag: the outer boundary of the imaged diffusion zones constitutes an “iso-coverage boundary.” We describe the time and temperature behavior of these iso-coverage zones, and present a simple continuum model that describes the iso-zone size as a function of the diffusion and desorption rates.

¹Financial support from the National Science Foundation through grants DMR-0203097 and DMR-0320908, and from Deutsche Forschungsgemeinschaft through SFB616 “Energy Dissipation at Surfaces” is gratefully acknowledged.

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Date submitted: 30 Nov 2005

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