Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Coherent x-ray surface scattering applied to Pt (001)[1] MICHAEL S. PIERCE, DANIEL HENNESSY, KEE-CHUL CHANG, Materials Science Division, Argonne National Laboratory, VLADIMIR KOMANICKY, Faculty of Science, Safarik University, ALEC SANDY, JOSEPH STRZALKA, Advanced Photon Source, Argonne National Laboratory, HOYDOO YOU, Materials Science Division, Argonne National Laboratory — Scattering using highly coherent light provides information about the very small scale, but over a very large area suitable for an ensemble measurement. We have used coherent x-ray diffraction to study the surfaces Pt (001) single crystal surfaces at high temperature in vacuum and compare them with earlier measurements of Au (001) in similar conditions. Both metals possess a temperature dependent quasi-hexagonal surface reconstruction. The speckled scattering patterns can be quantitatively compared against each other to determine how quickly configuration is changing, even when the macroscopically the system appears in equilibrium. We have been able to obtain measurements of the dynamic temperature dependent surface processes for these two different systems. For Pt (001) we have also directly observed step-flow motion of the terraces, obtaining step-edge velocity as a function of temperature. Our results point to two very different mechanisms at work in lifting the surface reconstruction at high temperature in vacuum.

[1]Work at ANL is supported by DOE-BES and work at SU by VEGA.

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Date submitted: 30 Nov 2010 Electronic form version 1.4