

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

LEED study of the orthorhombic $\text{Al}_{13}\text{Co}_4$ (100) surface and its interaction with Xe¹ RENEE D. DIEHL, HEEKEUN SHIN, Penn State University, KATARIINA PUSSI, Lappeenranta University of Technology, PETER GILLE, University of Munich — The (100) surface of orthorhombic $\text{Al}_{13}\text{Co}_4$ is a periodic approximant of the decagonal Al-Ni-Co 10-fold quasicrystalline surface. An STM study [1] of $\text{Al}_{13}\text{Co}_4$ shows the surface has two different terminations and that the relative amounts of each are dependent on the surface preparation. We will present a dynamical LEED study of the T1-termination of the $\text{Al}_{13}\text{Co}_4(100)$ surface, obtained by annealing at 1173K for 2 hours. Xe adsorbs on this surface in a layer-by-layer growth mode, and at a sufficiently high coverage it orders into four domains of close-packed Xe. These domains are rotationally aligned along certain crystallographic directions, where they appear to lock into uniaxial higher-order commensurate structures. The structures and thermodynamics of Xe film growth will be presented.

[1] R. Addou et.al, Physical Review B 80, 014230(2009).

¹This work was supported by NSF DMR-0505160 and the Donors of ACS-PRF.

Renee Diehl
Penn State University

Date submitted: 09 Dec 2009

Electronic form version 1.4