

Abstract Submitted
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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).

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