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**The growth of Xe on the 10-fold Al-Ni-Co Quasicrystal Surface** RENEE DIEHL, NICOLA FERRALIS, RALUCA TRASCA, MILTON COLE, Physics Department, Penn State University, WAHYU SETYAWAN, STEFANO CURTAROLO, Mech. Eng. and Materials Science Dept., Duke University — The growth of Xe films on tenfold decagonal Al-Ni-Co was studied using low-energy electron diffraction and He-atom scattering. Adsorption isobars indicate layer-by-layer growth of Xe in the temperature range of 60K to 120K. The first layer apparently possesses the symmetry of the substrate, but at the onset of the second layer, the film reorders into a 6-fold structure. This 6-fold structure has domains that are aligned along the 10-fold directions of the quasicrystal, leading to a diffraction pattern having 30-spot rings. The domain size of the Xe is at least 160 angstroms. The bilayer is consistent with two layers of bulk fcc(111) Xe. Further adsorption produces further ordered growth of the film. A Xe-substrate potential computed using Lennard-Jones potentials was used as the basis for Monte Carlo simulations that agree substantially with these measurements. Such studies provide powerful insight into growth processes on quasicrystal surfaces.

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