

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Dynamical LEED analysis of a quasicrystalline Cu film using periodic approximant structure models** RENEE DIEHL, Penn State University, KATARIINA PUSSI, Lappeenranta University of Technology — Quasicrystalline surfaces pose a challenge to diffraction techniques since they have no periodicity. They do, however, have good long-range order and produce diffraction patterns with sharp peaks. Copper grows on the 5-fold surface of i-Al-Pd-Mn in a layer-by-layer mode. Although its atomic structure cannot be determined by STM, the diffraction pattern from a 5-layer thick film consists of sharp peaks and streaks, the location of which indicate that this film consists an aperiodic array of rows of periodically-spaced Cu atoms. We have applied the method of periodic approximants in a dynamical LEED analysis of the structure of this quasiperiodic copper film to determine the atomic structure of the Cu film. This analysis indicates that the Cu film has a distorted cubic structure that conforms to the quasiperiodic substrate structure, providing an example of periodic-aperiodic structure matching. This research is supported by NSF-DMR-0505160 and the Academy of Finland.

Renee Diehl  
Penn State University

Date submitted: 20 Nov 2008

Electronic form version 1.4