Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Order-Disorder Transitions for Au/Mo(112) KEISUKE FUKUTANI, University of Nebraska-Lincoln, YAROSLAV LOSOVYJ, NATALIA LOZOVA, Center for Advanced Microstructure and Devices, Louisiana State University, IVAN YAKOVKIN, National Academy of Science of Ukraine, Institute of Physics, NING WU, PETER DOWBEN, University of Nebraska-Lincoln — Order-disorder overlayer phase transitions are observed at the surface of Au/Mo(112) for the nominal Au coverages of 1.66 and 1.75 monolayers. These transitions are characterized by the abrupt change in the surface Debye temperature. In the search for the detailed mechanism of this phase transition, we investigated the electron-phonon coupling (EPC), in the vicinity of the Fermi level, for the surface states of Au-covered Mo(112) surface from high- resolution angle resolved photoemission data taken parallel to the surface corrugation (i.e. $<\underline{11}1>$). The changes of the widths of the surface weighted bands, induced by Au layers, are discussed in terms of electron-electron interactions, electron-impurity scattering and electron-phonon coupling. Gold overlayers suppress the mass enhancement of the Mo(112) surface band crossing the Fermi level at 0.54 Å^{-1}. The data indicate that significant contributions from impurity and defect scattering must be considered in any serious analysis of the imaginary part of the self energy and that there interface effects can have a profound influence on the imaginary part of the self energy.

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Date submitted: 05 Nov 2010 Electronic form version 1.4