

MAR07-2006-004612

Abstract for an Invited Paper
for the MAR07 Meeting of
the American Physical Society

Quantum size effects in metallic thin films: from thermodynamic stability to superconductivities¹

CHIH-KANG SHIH, The University of Texas at Austin

In ultra-thin epitaxial metallic film, confinement of electronic states along the vertical direction leads to the formation of quantum well states (QWS). Over the past few years it has been shown that such QWS have profound effects on the thermodynamic stability of thin metal films. It has also been shown that such QWS can modulate local free energy landscape and influence the kinetic processes of mass transport. More recently, evidences that such QWS can also impact collective electronic properties such as superconductivities have also been reported. This talk will focus on direct correlations of all these aspects.

¹This work was supported by the National Science Foundation DMR-0306239 and DMR-0606485.