Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

**Study of dislacation Ni-Cu interface interaction with Peierls-Nabarro model** WEI XIAO, NICK KIOUSSIS, GANG LU, Department of Physics and Astronomy, California State University, Northridge, NASR GHONIEM, Department of Mechanical & Aerospace Engineering, School of Engineering and Applied Science, University of California, Los Angeles, CALIFORNIA STATE UNIVERSITY, NORTHRIDGE TEAM, UNIVERSITY OF CALIFORNIA, LOS ANGELES COLLABORATION — Metallic multi-layered structures have received increasingly interest in the past few years because of their unusual and interesting mechanical properties and high strength-to-weight ratio. The mechanical properties of an interface are determined, in large part, by the nature of the chemical bonding at the interface, which may be significantly different from that within either of the materials meeting at the interface. The resistance of interfaces to dislocation transmission is a fundamental quantity that often serves to control strength in plastically deforming multiphase materials. We have generalized an multi-scale approach based on semi-discrete variational generalized Peierls-Nabarro (SVGPN) for the pure Cu, Ni, and the (001) Ni-Cu interface have calculated from ab initio calculations. Various dislocation properties, such as the core width, energy, the Peierls stress, the dissociation behavior are investigated and compared to those of pure Cu and Ni hosts. Supported by US Air Force grant 0205GDD417.

Wei Xiao
Department of Physics and Astronomy
California State University Northridge

Date submitted: 03 Dec 2004 Electronic form version 1.4