

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Anisotropic plasmon excitation and dispersion of Ag nanowires on Cu(110)¹ I. SENEVIRATHNE, ASOKA SEKHARAN, RICHARD KURTZ, PHILLIP SPRUNGER, Louisiana State University — Epitaxial Ag nanowires have been found to self-assemble on Cu(110) exceeding 1.2 ML. The plasmon excitation and dispersion of these nanowires have been characterized by low-energy reflection EELS. Previous STM images reveal that the Ag nanowires are approximately 2 nm (~ 12 nm) in height (width). However, the nanowires orientate with the long axis parallel to the $[-110]$ substrate direction and possess an anisotropic morphology. EELS reveals that the Ag plasmon excitation of 3.7 eV at the zone-center and is nearly dispersionless perpendicular to the nanowire direction. However, parallel to the Ag nanowires, EELS shows a slight red-shift of the plasmon at $q = 0$ and disperses to higher energy with increasing momentum transfer. These results will be discussed in light of recent ARPES band-structure measurements, electronic calculations, and anisotropic optical measurements of the Ag nanowires.

¹Supported by NSF/DMR-050465

Phillip Sprunger
Louisiana State University

Date submitted: 19 Dec 2007

Electronic form version 1.4