

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Scattering times of image-state electrons on flat and stepped bimetallic Ag/Pt surfaces** SERBAN SMADICI, RICHARD OSGOOD JR., Columbia University — Scattering dynamics of electrons on flat Ag/Pt(111) and stepped Ag/Pt(997) surfaces was probed by femtosecond angle-resolved 2-photon-photoemission. An asymmetric splitting of the  $n=1$  image-state dispersion for 1 ML-Ag covered stepped Pt(997) surface was clearly observed and is tentatively attributed to diffraction of the final state electron. Our femtosecond pump-probe setup enabled measurement of the 2-photon cross-correlation traces, which access the scattering dynamics of image-state electrons. In contrast to the Ag(111) surface, for 2 ML-Ag covered Pt(111) surface, the lifetime of the  $n=2$  image state was observed to be larger than that of the  $n=1$  image state. This behavior is attributed to the overlap of image-state wave functions with Pt substrate bulk electrons and is in agreement with the alignment of the image-state energies with respect to projected bulk bands. The momentum dependence of the image-state scattering time for the stepped 2 ML Ag/Pt(997) surface and flat 2 ML Ag/Pt(111) surface will also be discussed. This work was supported by DOE under contract number DE-FG02-90ER14104.

Serban Smadici  
Columbia University

Date submitted: 01 Dec 2004

Electronic form version 1.4