

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Spatio-temporal dynamics of plasmons on a metal cone ALEJANDRO RODRIGUEZ PEREZ, JOONHEE LEE, SHAWN M. PERDUE, V. ARA APKARIAN, Department of Chemistry, University of California, Irvine — Localized surface plasmons (LSP) and propagating plasmon modes (PPM) field emit at the singularity of the metallic tip apex upon ultrafast optical excitation. Interferometric measurements, using frequency modulation-demodulation techniques, allow the characterization of the time profile of the optical field emission and the space-time profile of the propagating modes. A pump pulse launches a plasmon that oscillates on the cone and coherently interferes with a time-delayed probe pulse which is cross-polarized with respect to the pump. We present a simple model that accurately describes the experimental results. However, the observations of trapped propagating modes, their lifetime, and their polarization are not predicted by current theories, which describe tip-plasmons as strictly transverse magnetic modes.

Joonhee Lee
Department of Chemistry, University of California, Irvine

Date submitted: 10 Nov 2011

Electronic form version 1.4