

**2012 Materials Research Society Fall Meeting
November 25 – November 30, 2012,
Boston Massachusetts USA
CC9: Poster Session: Optical Materials and Devices III
Wednesday PM, November 28, 2012
Hynes, Level 2, Hall D**

8:00 PM - CC9.18

Plasmonic Halo: A Nanogap-excited Surface Plasmon Standing Wave Resonance

Fan Ye¹, Michael J. Burns¹, Michael J. Naughton¹.

¹ Department of Physics, Boston College, Chestnut Hill, Massachusetts, USA.

We have fabricated and modeled via electromagnetic simulations surface plasmon standing wave resonances that are excited by optically-illuminated metallic nanogaps. In microscale disks prepared with optically-plasmonic metals, visible light incident on a like metal surface separated from the disk by a nanogap can induce plasmon modes. The outer metal can then form a type of "halo" boundary condition that confines the propagating plasmon, yielding a standing wave pattern akin to a plasmonic corral. We have observed and characterized such standing wave patterns in the near-field using NSOM. In addition, we have observed novel far-field effects via optical microscopy, wherein changing the size(s) of the disks and/or nanogaps enables tuning of the wavelength of light launched into far-field from the plasmonic halo. This work is supported by the W.M. Keck Foundation.