

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Near-field nano-imaging and nano-spectroscopy of Percolating Thin Gold Films XINZHONG CHEN, JIAWEI ZHANG, ZIHENG YAO, STEPHANIE GILBERT CORDER, MATTHEW SHEINMAN, State Univ of NY- Stony Brook, HANS BECHTEL, MICHAEL MARTIN, Lawrence Berkeley National Laboratory, MENGKUN LIU, State Univ of NY- Stony Brook, LARRY CARR, Brookhaven National Laboratory — We investigated the infrared (IR) properties of percolating thin gold films on sapphire substrate at macro- and mesoscopic scale. Using scattering type scanning near-field optical microscopy (s-SNOM), ultra-broadband infrared nano-spectroscopy (ALS SINS), and infrared far-field spectroscopy, we performed a systematic study of the global and local IR spectrum of ~ 30 nm gold films at 3-25 μ m range. The inhomogeneous gold films below or above percolation threshold exhibit distinct DC, IR far-field, and IR near-field responses. We discuss in details the correlation between the degree of percolation and the infrared near-field properties of the films.

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Date submitted: 10 Nov 2016

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