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Wakana Kubo(TUAT), Yoshimasa Kawata(Shizuoka Univ.), Dangyuan Lei(The Hong Kong Polytech. Univ.)

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3:45 PM - 4:15 PM

▲[5p-A410-8][JSAP-OSA Joint Symposia 2017 Invited Talk]

Nonlinear Optical Mapping and Spectroscopy of Gap Plasmons in Single Plasmonic Golden Junctions

ODangyuan Lei¹ (1.Hong Kong PolyU)

Keywords:nonlinear plasmonics, gap plasmons, plasmonic golden junctions

Plasmonic golden junctions comprised of subwavelength metallic nanoparticles separated from a metal thin film by a nanometer-thick spacer have been used to achieve dramatic enhancement in the second- and third-harmonic generation efficiency of metals. In addition to the popularity in nonlinear plasmonics, this fascinating system has also captured a growing interest in the studies of nonlocal plasmonics, single-molecule strong coupling and optomechanics, and plasmon-enhanced Raman scattering. In this talk, I will show our earlier and recent studies on the linear and nonlinear optical properties of single plasmonic particle-on-film junctions. On the one hand, I will discuss how theoretical approaches such as transformation optics and plasmon hybridization theory can be applied to understand the rich properties of the gap plasmons supported in such nanocavities, including plasmon mode hybridization and resonance lineshape engineering. On the other hand, I will show the use of a polarization-resolved dark-field microscope to measure the spectral response and image the radiation pattern of the gap plasmons. Finally, I will demonstrate the utilization of such gap modes for enhancing various optical phenomena such as photoluminescence, second-harmonic generation and two-photon photoluminescence, and probing the incident longitudinal-field distribution.