Supplemental Information for

# Gap-mode excitation, manipulation, and refractive-index sensing application by gold nanocube arrays

Liang Li,[a,b] Shaolong Wu,[*a,b] Liujing Li,[a,b] Zhongyuan Zhou,[a,b] Hao Ding,[a,b] Chenhong Xiao,[a,b] and Xiaofeng Li[*a,b]

[a.]School of Optoelectronic Science and Engineering & Collaborative Innovation Center of Suzhou Nano Science and Technology, Soochow University, Suzhou 215006, China.

[b.]Key Lab of Advanced Optical Manufacturing Technologies of Jiangsu Province & Key Lab of Modern Optical Technologies of Education Ministry of China, Soochow University, Suzhou 215006, China.

*E-mail: shaolong_wu@suda.edu.cn; xfli@suda.edu.cn

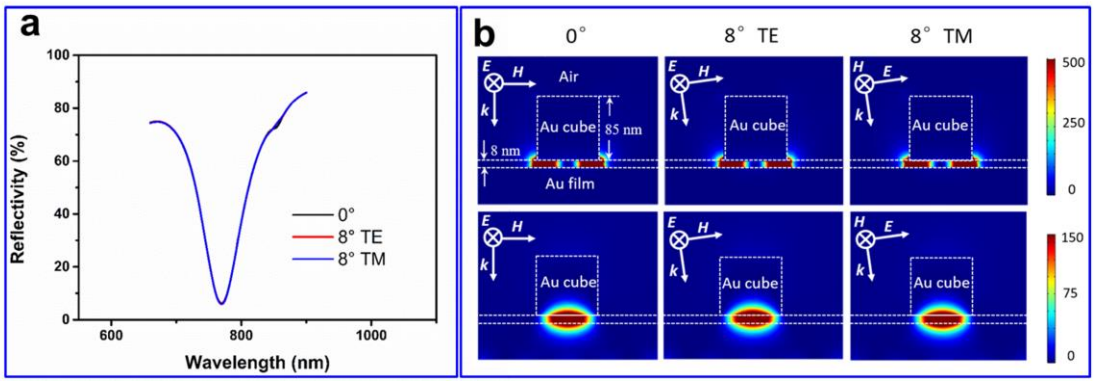


**Fig. S1.** (a) Simulated reflection spectra of the periodical Au NCAs (edge length $L$= 85 nm, period $P$=241 nm) atop Au film with a spacer (height $h$=8 nm) under normal incidence or 8° off the normal incidence (as the same as the incident angle used in measurement), (b) the corresponding profiles of normalized electric field ($|E/E_0|^2$, the upper row) and magnetic field ($|H/H_0|^2$, the lower row) at the wavelength of reflection dip.

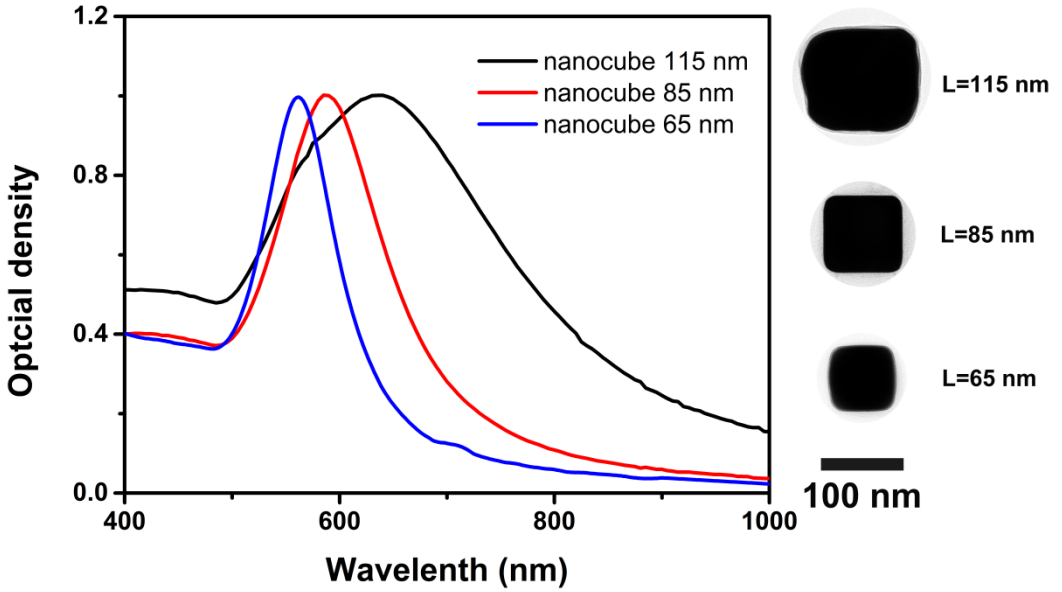


**Fig. S2.** Measured optical density of Au nanocubes in varying sizes (i.e., edge length $L$=65 nm, 85 nm or 115 nm). The insert on the right column is the corresponding TEM images.

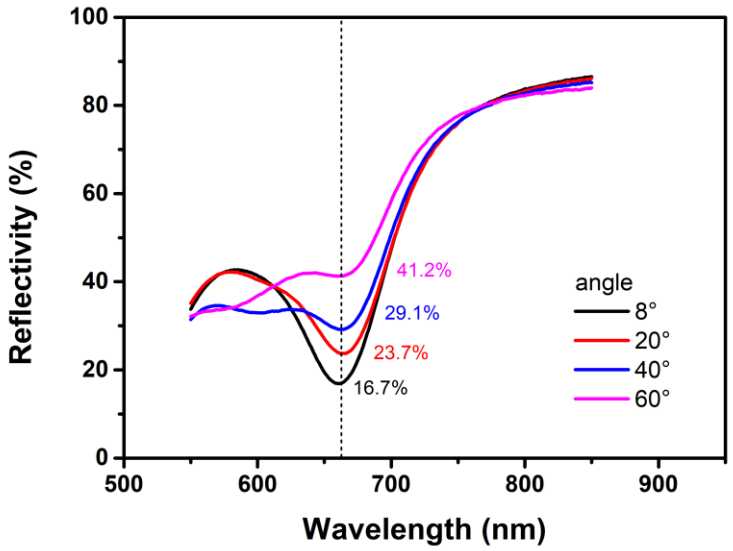


**Fig. S3.** Measured reflectance spectra of the prepared Au NCAs atop the Au film with a spacer (fill fraction $ff$=11.2%, edge length $L$=65 nm, spacer height $h$=12 nm) under un-polarized irradiation with various incident angles.