Abstract Submitted
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Plasmonic antenna array at optical frequency based on nanoapertures[1] RUWEN PENG, ZHIJIAN ZHANG, LIUYANG SUN, ZHAN WANG, FENG GAO, National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, China, XIANRONG HUANG, National Synchrotron Light Source II, Brookhaven National Laboratory, Upton, New York 11973-5000, USA, MU WANG, National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, China — We demonstarte here that the plasmonic array based on nanoapertures in ultrathin silver film radiates at optical frequency and behaves as an optical antenna array (OAA). When the incident light illuminates the nanohole array, the localized surface plasmons are excited and serve as electric dipoles. The far-field radiation originates from the coherent superposition of plasmonic emissions on each bank of the aperture. The radiation of OAA presents a strong directivity, which depends on the in-plane rotation of aperture array, and on the polarization and incidence angle of the excitation light as well. We suggest that these features have potential applications in photovoltaics, light-emitting devices, and optical sensors. Reference: Z. J. Zhang, R. W. Peng, Z. Wang, F. Gao, X. R. Huang, W. H. Sun, Q. J. Wang, and Mu Wang, Appl. Phys. Lett. (2008) 93, 171110.

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