Abstract Submitted
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Finite Size Effects on the Electromagnetic Field Enhancement from Low-dimensional Silver Nanoshell Dimer Arrays[1] YOULIN SONG, Zhengzhou University, KE ZHAO, University of Tennessee, YU JIA, XING HU, Zhengzhou University, ZHENYU ZHANG, Oak Ridge National Laboratory — Finite size effects on the optical properties of one-dimensional (1D) and 2D nanoshell dimer arrays are investigated using generalized Mie theory and coupled dipole approximation within the context of surface-enhanced Raman spectroscopy (SERS). It is shown that the huge enhancement in the electromagnetic (EM) field at the center of a given dimer oscillates with the length of the 1D array. For an array of fixed length, the EM enhancement also oscillates along the array, but with a different period. Both types of oscillations can be attributed to the interference of the dynamic dipole fields from different dimers in the array. When generalized to 2D arrays, EM enhancement higher than that of the 1D arrays can be gained with a constant magnitude, a salient feature advantageous to experimental realization of single-molecule SERS. [K. Zhao et al, J. Chem. Phys. **125**, 081102 (2005); Y. L. Song et al, accepted by J. Chem. Phys.]

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