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Enhanced surface Raman scattering in gold thin films deposited on large array anti-nanoring template CHI CHIH HO, Nanoscience and Technology Program, Taiwan International Graduate Program, Institute of Physics, Academia Sinica, Taipei, Taiwan, TZE YANG LEE, Department of Engineering and System Science, National TsingHua University, Hsinchhu, Taiwan, WEI LI LEE, Institute of Physics, Academia Sinica, Taipei, Taiwan, FAN GANG TSENG, Department of Engineering and System Science, National TsingHua University, Hsinchhu, Taiwan — To evenly distribute hot spots over large area is an important subject for realistic applications using surface enhanced Raman scattering (SERS) effect. Here, we utilized a monolayer polymer/nanosphere hybrid to prepare a large area and well-ordered anti-nanoring template for gold thin film deposition. The resulting gold nanostructured thin film, which comprises an antidot network with isolated nano-disk (ND) and nanoring (NR) in each antidot, can be employed as an efficient SERS substrate. From finite difference time domain (FDTD) simulation, hot spots occur at the space between isolated ND and NR giving rise to enhanced surface Raman scattering. We fabricated a series of such gold nanostructured thin films with different thickness and geometry. An optimum condition for maximum SERS was obtained in experiment. Detailed size effect on SERS and comparison to FDTD simulation will be discussed.

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