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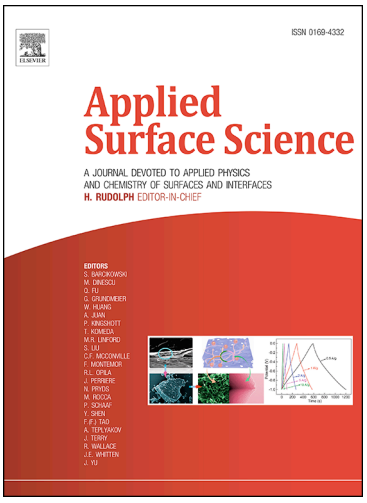

Full Length Article

Driving electromagnetic field enhancements in tailored gold surface nanostructures: optical properties and macroscale simulations

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Driving electromagnetic field enhancements in tailored gold surface nanostructures: optical properties and macroscale simulations

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Abstract

Gold thin films with remarkable Surface Enhanced Raman scattering activity strongly dependent on their surface nanostructure were grown by nanosecondpulsed laser ablation. By changing the number of the laser pulses, keeping fixed all the other deposition parameters, we deliberately modified the surface nanostructure of the films. These nanostructured films consist of metallic islands separated from each other by inter-island channels. We observed differences in both island sizes and inter-island channel sizes as a function of the laser pulse number. The different optical properties of the films such as the position of the localized surface plasmon resonance absorption peak red shifts with increasing the laser pulse number. We performed Finite-Difference Time-Domain calculations to gain insight on how the surface nanostructure of the film affects its optical properties at the macroscale. Results indicate

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