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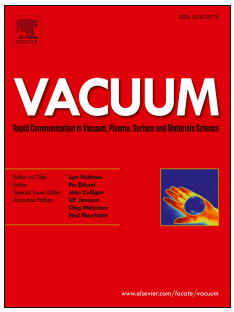

Gold-silver nanostructures: Plasmon-plasmon interaction

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Gold-Silver Nanostructures: Plasmon-Plasmon Interaction

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Abstract: Gold and silver coupled nanostructure system presents immense possibilities for understanding plasmon-plasmon interaction in colloidal suspension. The origin of surface plasmon resonance (SPR) in noble metal nanostructures and the dependence of SPR on various factors have been widely investigated and the interactions of plasmons have also been studied. However, the plasmon-plasmon coupling in interchangeable core and shell plasmonic materials is not clearly understood. In this work we present synthesis of Au-Ag and Ag-Au core-shell nanostructures i.e. the materials of the core and the shell can be interchanged. For such interchangeable core-shell noble metal nanostructures, we see that the plasmon-plasmon interaction is not only dependent on the size, shape, polarities etc. but also on the position of a particular metal in the composite structure. Experimentally, the plasmon resonance interaction is studied by simple absorption spectroscopy and the structure is investigated by electron microscopy. Classical model of simple, forced vibration of damped, coupled oscillators with Coulombic couplings is utilized to understand the