

Self-organized arrays of gold nanoparticles : morphology and plasmonic properties

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Abstrak

This thesis addresses the fabrication and investigation of the optical response of gold nanoparticle arrays supported on insulating LiF(110) nanopatterned substrates. Motivated by the discovery of the intriguing effects that arise when electromagnetic radiation interacts with metallic nanostructures, the thesis focuses on the application of bottom-up approaches to the fabrication of extended-area plasmonic nanostructures, and the optimization of their optical response.

By developing a sophisticated effective-medium model and comparing the experimental findings with model calculations, the author explores the role of the interparticle electromagnetic coupling and array dimensionality on the collective plasmonic behavior of the array, giving insights into the physical mechanisms governing the optical response.