

Abstract Submitted  
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**Plasmon Hybridization in finite and periodic structures** DANIEL BRANDL, PETER NORDLANDER, Rice University — We have extended the plasmon hybridization method[1] to periodic structures of metallic nanoparticles. The approach allows for simple and intuitive calculations of the plasmonic band structure of periodic chains or arrays of nanoparticles. The method allows for the inclusion of arbitrarily high multipolar interactions between the individual nanoparticles and interaction distances beyond nearest neighbor couplings. We also present an investigation of how the plasmonic structure of a finite chain approaches that of an infinite periodic structure. The plasmonic structure of a nanostructure array is shown to consist of bands made up of hybridized plasmons of the individual nanoparticles. [1] E. Prodan, C. Radloff, N.J. Halas, and P. Nordlander, *Science* 302(2003) 419; E. Prodan and P. Nordlander, *J. Chem. Phys.*120(2004) 5444

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