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Optical studies of plasmon resonances in Ag nanoparticle arrays. R. VALDES AGUILAR, G. EVANS, H. D. DREW, S. H. GUO, T. CORRIGAN, R. PHANEUF, Laboratory for Physical Sciences, College Park, MD 20740 and University of Maryland, College Park, MD 20742 — The optical (UV and visible) response of Ag nanoparticle arrays is studied in reflection measurements. The behavior (position and width) of the plasmon resonance is investigated as a function of size and shape of the nanoparticles. While the resonant frequencies can be understood in terms of the Mie type resonant response of ellipsoidal particles the widths of the resonances are controlled by radiation damping and is very sensitive to particle size. A model based on the Maxwell-Garnett effective medium theory is developed to comprehend the behavior of the resonance.

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