

Abstract Submitted  
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**Cavity Resonances in Plasmonic Patch Nanoantennas**

AYAN CHAKRABARTY, FENG WANG, FRED MINKOWSKI, QI-HUO WEI, Kent State University — Plasmonic nanoantennas allow for confining and detecting photons at very small length scales. This work presents our recent experimental and theoretical studies of two dimensional periodic arrays of elliptical metal nano-patches on a silver film with a dielectric gap layer. Simulation and theoretical results shows that various cavity modes can be excited with tilted or normal incident light, and that the azimuthal symmetry breaking makes the nanoantennas polarization sensitive due to different resonant frequencies of the even and odd cavity modes. Particularly, it is shown that the cavity modes can be well described by a product of Mathieu functions, providing good agreements with both simulations and experiments. The effects of coupling between the cavity modes and the propagating plasmons will be discussed.

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