Abstract Submitted
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Polarization-sensitive optical response of plasmonic metasurfaces[1] PAUL G. THOMPSON, CLAUDIU G. BIRIS, EDWARD J. OSLEY, University College London, RICHARD M. OSGOOD, JR., Columbia University, NICOLAE C. PANOIU, PAUL A. WARBURTON, University College London — We have fabricated arrays of nanoscale asymmetric cruciform apertures that support localized surface-plasmon polaritons (LSPPs) in the lower mid-infrared. The cruciform apertures were created by focussed ion beam milling into a gold film on a CaF_2 substrate. The measured transmission spectra of these arrays show two distinct maxima that correspond to the excitation of LSPPs, the magnitude of which can be tuned by varying the in-plane electric-field polarization of the incident photons. These findings are further validated by simulations based on the rigorous coupled-wave analysis method, namely, the maxima of the transmission spectra correspond to hybridized localized surface plasmon resonances in the two arms of the cruciform aperture. More generally speaking, it is demonstrated that the planar distribution of polarization-dependent LSPPs can be viewed to form a polarization-sensitive plasmonic metasurface. We will discuss possible applications of these plasmonic arrays in biosensing.

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