Supplementary Information (SI) for Nanoscale.

Tuning of plasmonic surface lattice resonances: on the crucial impact of the excitation efficiency of grazing diffraction orders

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Supporting information

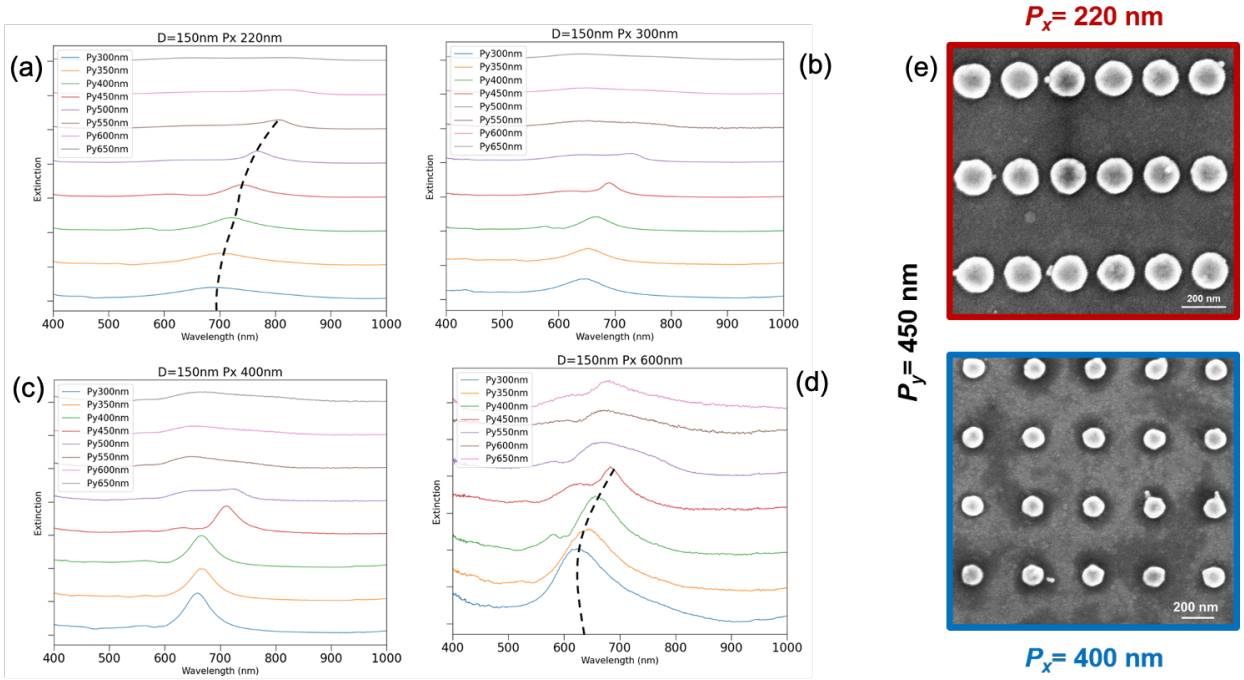

Figure SI 1: Experimental extinction spectra of rectangular array of gold disk of D=150nm and period P_x= (a) 220nm,(b) 300nm,(c) 400nm and (d) 600nm, the black dotted line in (a) and (d) depict the shift of resonance response with change in P_y

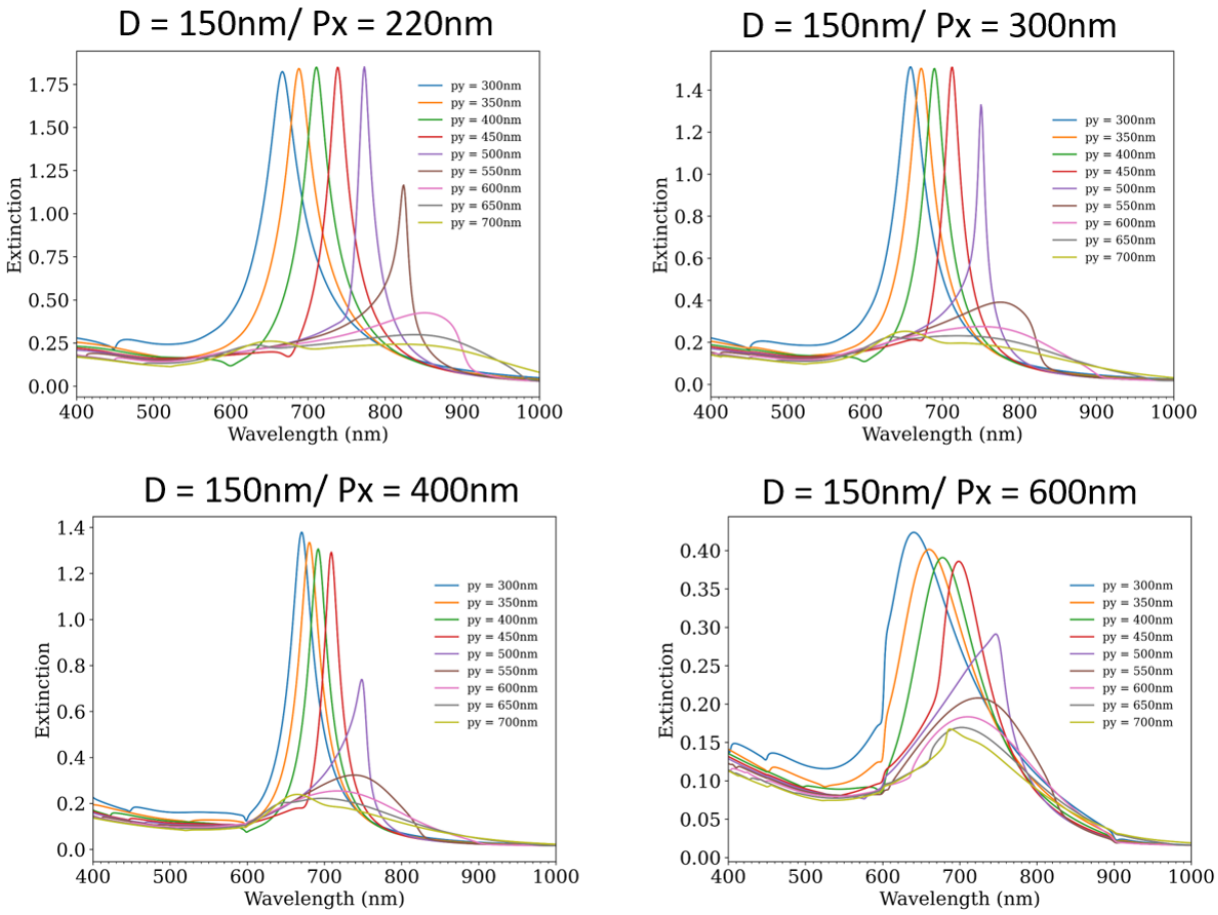

Figure SI 2: ((a-d) calculated extinction spectra of the rectangular arrays of gold disks of diameter D=150nm and height h=50nm deposited on a glass substrate coated by a thin ITO layer for fixed P_X = 220nm, 300nm, 400nm and 600nm, in this order. The polarization direction is along the X axis.

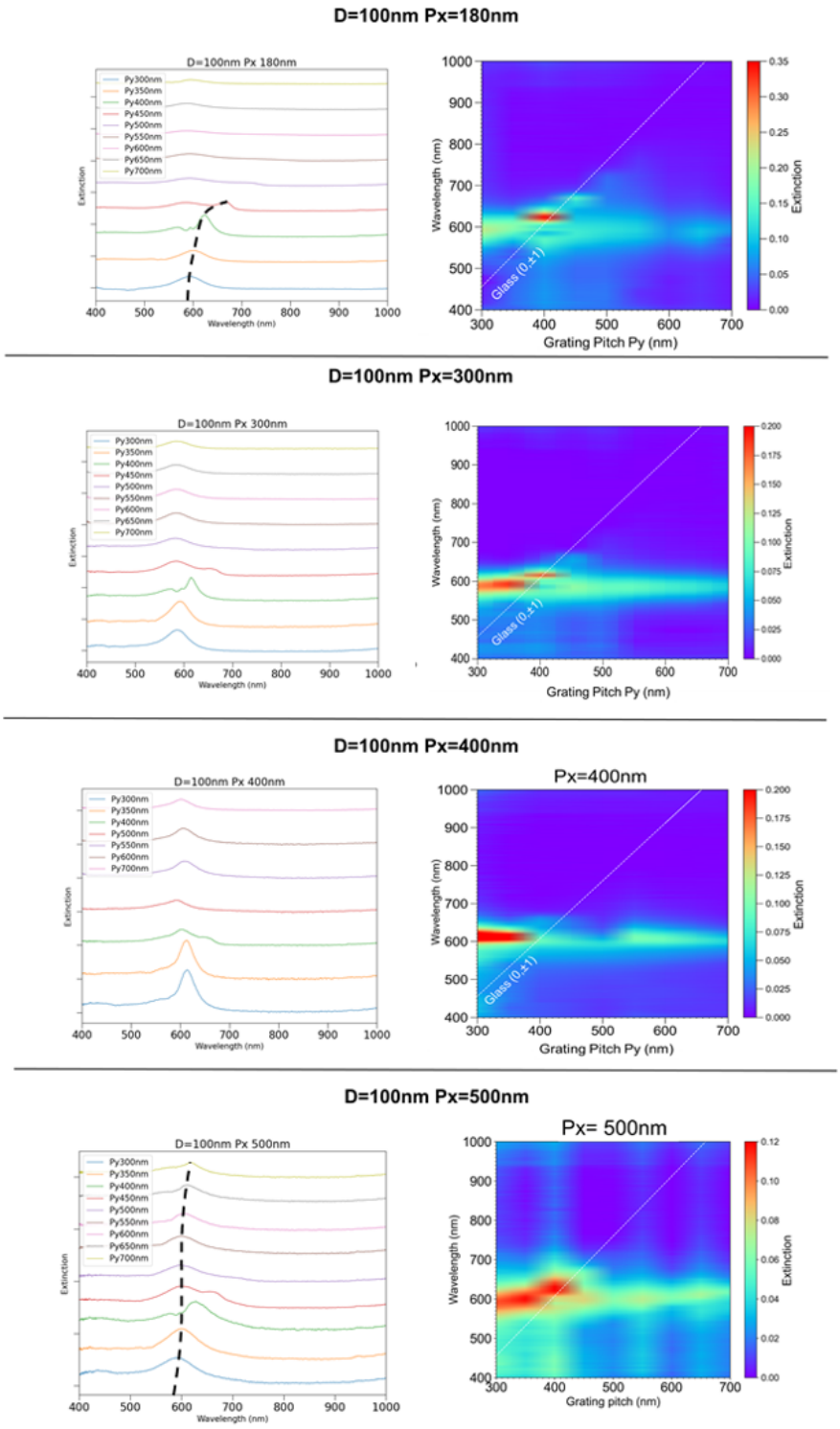

Figure SI 3: (a-d) Experimental Extinction and dispersion diagrams of the rectangular arrays of D=100nm for fixed P_X = (a) 160nm,(b) 180nm,(c) 300nm and (d) 400nm ,respectively. The polarization direction is along the X axis.For the extinction spectra, the black dotted line in (a) and (d) depict the shift of resonance response with change in P_y. Meanwhile for the dispersion diagram, the Rayleigh anomaly position is displayed in a white line for the (0,± 1) orders in the substrate.

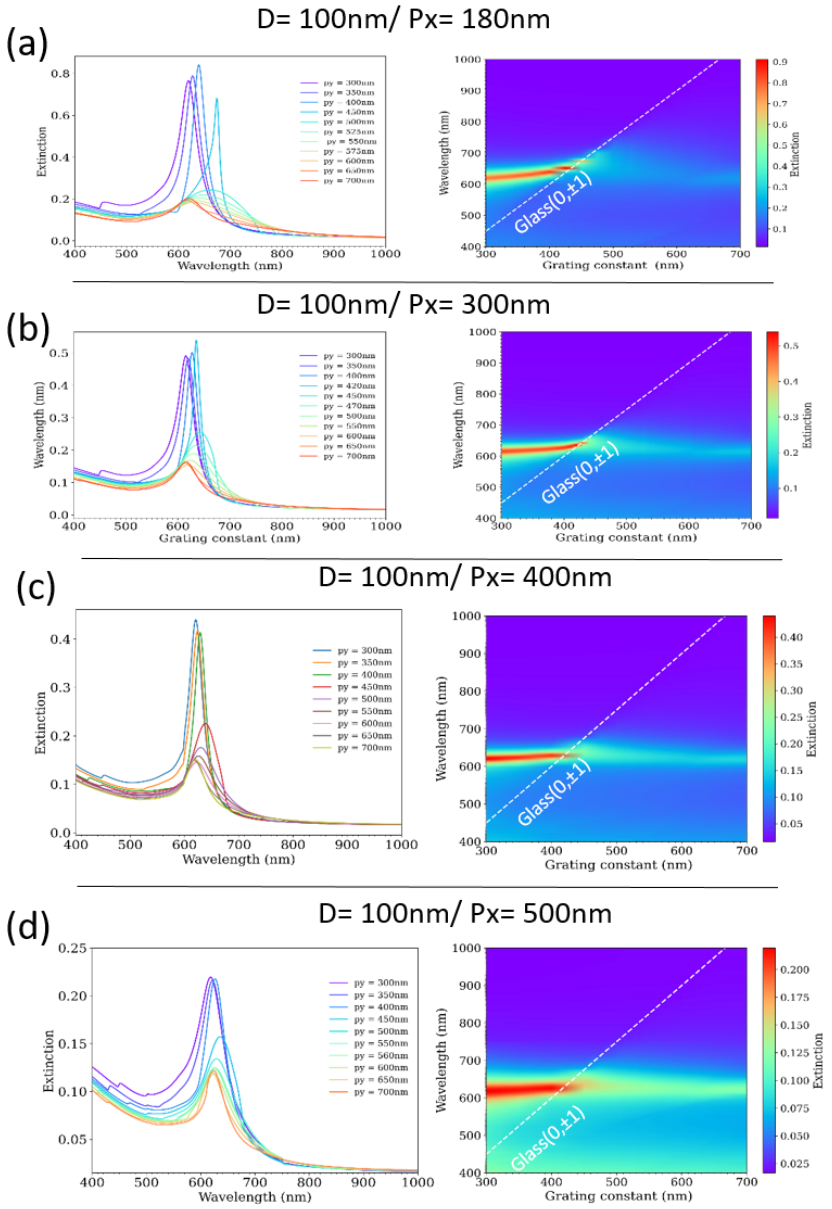

Figure SI 4: (a-d) Calculated extinction and dispersion diagrams of the rectangular arrays of D = 100nm for fixed P_X = (a)180nm,(b)300nm,(c)400nm and (d)500nm ,respectively. The polarization direction is along the X axis. For the dispersion diagram, the Rayleigh anomaly position is displayed in a white line for the (0,± 1) orders in the substrate.

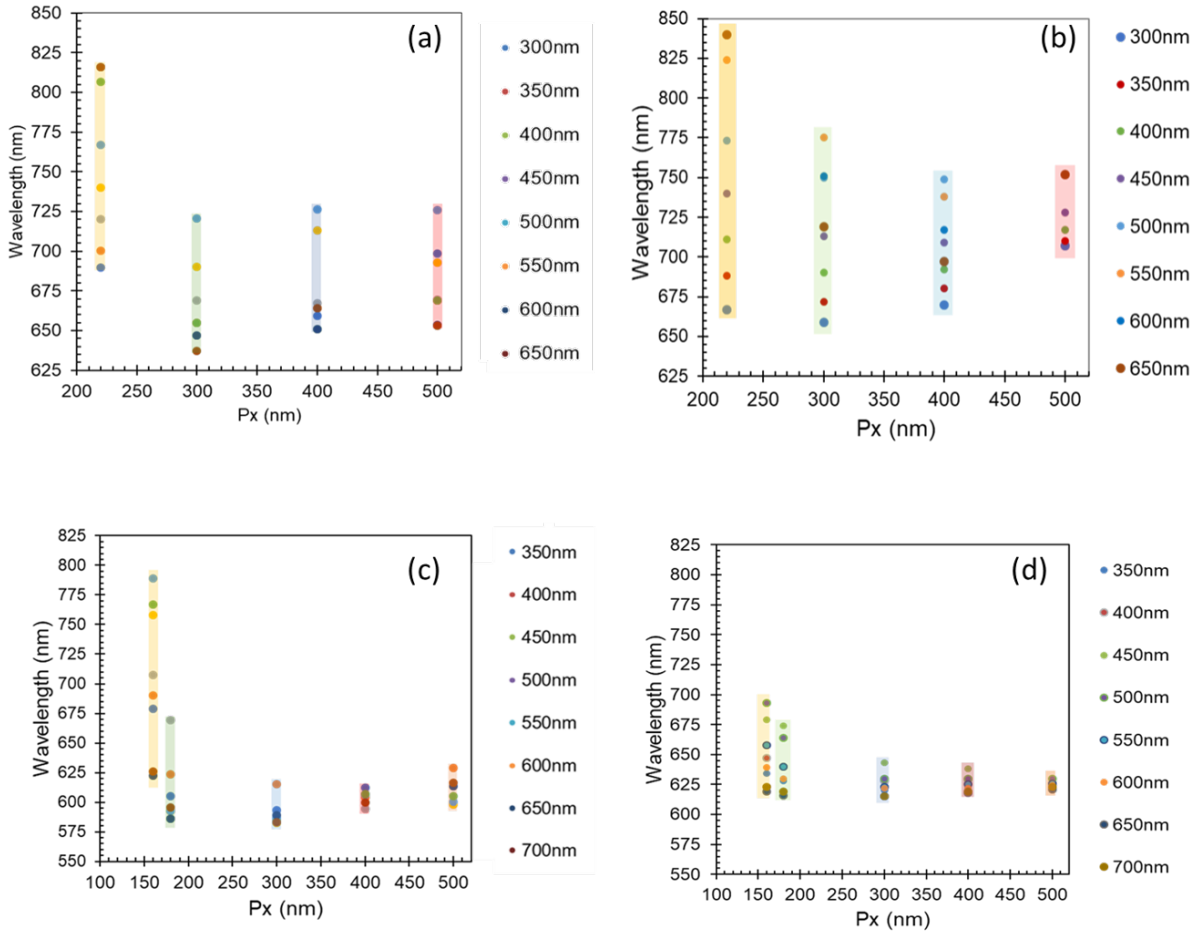

Figure SI 5: Spectral range of the red-shift in the SLR when varying the grating constant P_Y for different P_X values: (a) and (b): experimental and calculated SLR wavelengths for arrays with disks of D=150 nm, respectively. (c) and (d): experimental and calculated SLR wavelengths for arrays with disks of D=100 nm, respectively. It demonstrates that asP_X increases, the magnitude of the SLR red-shift decreases with variations in P_Y.

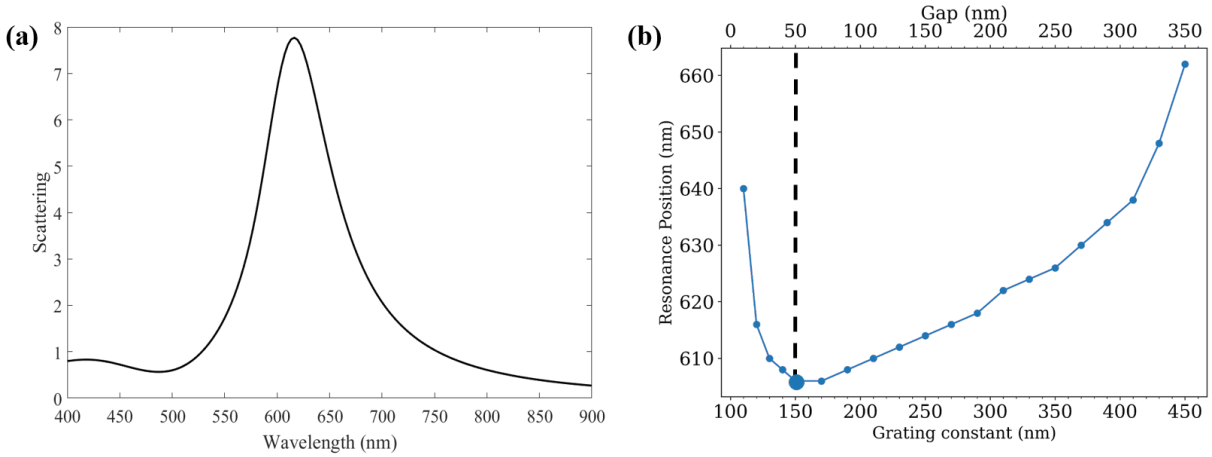

Figure SI 6: (a) Calculated scattering efficiency spectrum of a single gold nanodisk. (b) Resonance wavelengths of square arrays of the same gold nanodisks as a function of the gratings' constant. The nanodisks have a diameter D=100nm and height H=50nm and are deposited on a glass substrate and surrounded by air.