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Influence of gold metallodielectric semi-shell orientation and geometrical irregularities on dark plasmon resonances. SHUANG FANG LIM, Department of Physics, North Carolina State University — The geometric asymmetry of gold semi-shells leads to orientation and fractional height dependent scattering. The reduced symmetry leads to additional magnetic plasmon resonances. We show scattering of light on semi-shells that is dependent on the fractional height coverage of the gold shell, dependent on its orientation, and positional and number dependence of well-defined protrusions on the semi-shell surface. We qualitatively and quantitatively explain for the contributions of the orientation, fractional height coverage, and the position and number of protrusions to the spectra. The metallic protrusions results in geometrical asymmetry, which leads to excitation of the optically dark quadrupole mode as a function of incident light excitation and polarization. We attribute the far field scattering peaks to the dipole and quadrupole resonances contributed by the protrusions on the semi-shell surface.

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