Electronic Supplementary Information (ESI) for

Small Morphology Variations Effects on Plasmonic Nanoparticle Dimer Hotspots

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Far-field extinction spectra

The calculated far-field extinction spectra of the bridged, creviced, faceted and roughened dimers are plotted in Fig. S1-S4. They are calculated by integrating the time-averaged extinction Poynting vectors $S_{\text{ext}}$ (i.e. electromagnetic power flow) over an auxiliary surface $A$ enclosing the dimer, respectively:1

$$S_{\text{ext}} = \frac{1}{2} \text{Re}\{E_{\text{inc}} \times H_{\text{sca}}^* + E_{\text{sca}} \times H_{\text{inc}}^*\}$$

(S1)

$$C_{\text{ext}} = -\iiint S_{\text{ext}} dA / |W_{\text{inc}}|$$

(S2)
where $E_{\text{inc}}$, $E_{\text{sca}}$, $H_{\text{inc}}$ and $H_{\text{sca}}$ are the incident and scattered electric and magnetic field respectively. $C_{\text{ext}}$ is the extinction cross section, $|W_{\text{inc}}| = \frac{1}{2}ce_0\varepsilon_0E_0^2$ is the power flow per unit area of the incident plane wave, $E_0$ (set at 1 V/m here) is the modulus of $E_{\text{inc}}$, $c$ is the velocity of light and $\varepsilon_0$ is the permittivity of vacuum.

**Figure S1.** FEM calculated far-field extinction spectra for the bridge dimers as $b$ is increased from 2 to 15nm, corresponding to Fig. 1.
**Figure S2.** FEM calculated far-field extinction spectra for the creviced dimers as $c$ is increased from 5 to 15nm, corresponding to Fig. 3.
Figure S3. FEM calculated far-field extinction spectra for the faceted dimers as $f$ is increased from 2 to 15nm, corresponding to Fig. 5.
Figure S4. FEM calculated far-field extinction spectra for the roughened dimers as $r$ is decreased from 30 to 12 nm, corresponding to Fig. 7.

Reference