

Plasmons within molecular junctions: towards time-resolved conductance measurements.

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The highly confined optical fields of plasmons within nano-scale metal gaps can efficiently mediate interactions between radiation and molecules residing in the gaps and are predicted to generate, modulate and steer by various mechanisms charge transfer processes through the molecules. Experimental systems demonstrating plasmon-effects on the dc-conductance of junctions will be presented.

With such an experimental capability at hand, and by using femtosecond laser pulses to create transient plasmons within junctions, an exciting possibility to perform time-resolved conductance measurements of molecular junctions becomes feasible. Initial results in this route will be presented along with some discussion on the experimental challenges involved in this kind of measurements and how critical artifacts can be avoided or ruled out.