

Scanning probe microscopy as a tool to study surface plasmon

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A surface plasmon used to be generated when metal nanoparticles or metal substrates are under light irradiation, where the conduction electrons of the metal are in resonance with the irradiated light. As a result, localized surface plasmon resonance and surface plasmon polariton can result in the metal nanoparticles and the metal substrate, respectively. Here, it is demonstrated that charge transfer occurring at the interface of the metal nanostructures can be directly observed through scanning probe microscopy (i.e. light-irradiated Kelvin probe force microscopy). In addition, it is also demonstrated that scanning probe microscopy can be used as a tool to fabricate plasmonic structures such as metal nanohole arrays, which is as known as scanning probe lithography.