

"Pushing IR s-SNOM and nano-FTIR signals via strong tip-substrate coupling"

Infrared nanoimaging and nanospectroscopy based on scattering-type scanning near-field optical microscopy and Fourier transform infrared near-field spectroscopy (nano-FTIR) are emerging nanoanalytical tools with large application potential for label-free mapping and identification of organic and inorganic materials with nanoscale spatial resolution. However, the detection of thin molecular layers and nanostructures on standard substrates is still challenged by weak signals. Here, we demonstrate a significant enhancement of s-SNOM and nano-FTIR signals of thin organic layers via strong tip-substrate coupling, particularly exploiting polariton-resonant tip-substrate coupling. Our results will be of critical importance for future s-SNOM and nano-FTIR spectroscopy of monolayers and single molecules.